DECEMBER 28, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

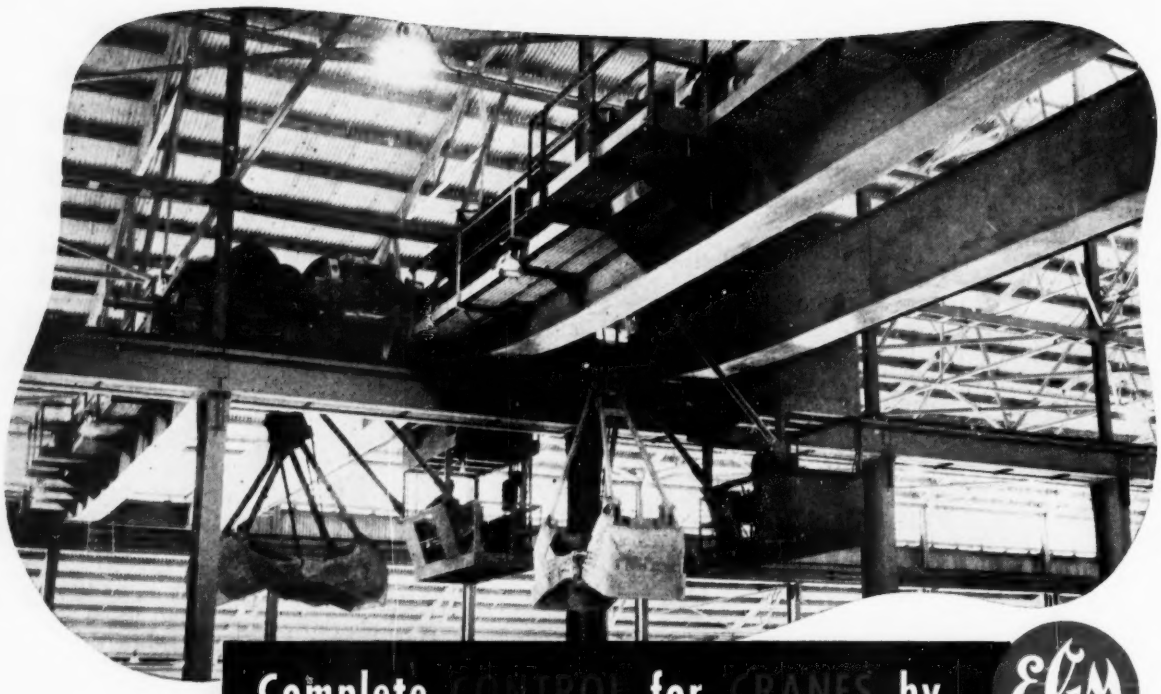
Europe Looks To Export Markets

— see page 38

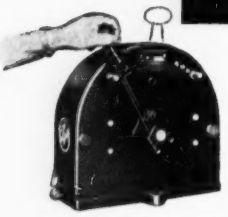
✓ **NICKEL SHORTAGE IN 1954?**
U.S. Stockpiling Hurts, p. 27

✓ **HI-TEMP ALLOY SKIMPS ON NICKEL**
Same Physicals, Better Ductility, p. 68

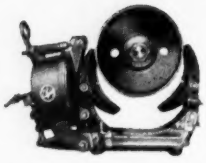
CONTENTS — PAGE 5



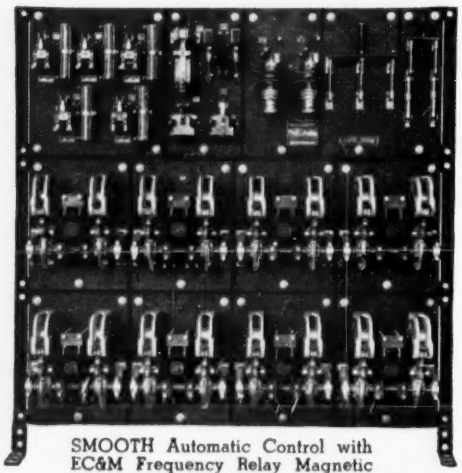
Complete CONTROL for CRANES by EC&M



SHORT-THROW Narrow-width Cam Master Switches are easy on the operator.



LONG - LIFE Brakes give high-speed performance — with low up-keep.



SMOOTH Automatic Control with EC&M Frequency Relay Magnetic Controllers.

Users Know EC&M Equipment Gives Top Performance . . . Low Up-Keep

EC&M Crane Apparatus and Control Engineering have a reputation for eliminating initial delays and for permitting production to be maintained at a high level throughout the life of the investment.

EC&M Crane Equipment is specially engineered for *each* crane. EC&M has *always* built control from the crane data sheet. Relay-settings resistor-fillings, brake-windings, etc., are matched to the actual crane-loading. Result is top performance right from the start.

Many crane users, when buying new cranes or revamping existing installations, specify EC&M Control. They know the extra margin of safety built into EC&M Equipment and the accurate engineering of the apparatus result in freedom from delays—smooth performance. Write EC&M into the specifications for your next crane.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79th STREET • CLEVELAND 4, OHIO

When Buying Cranes...Specify EC&M CONTROL

What is an Alloy Steel?

This is the first of a series dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many in this field, including men of broad experience who may find it useful to review fundamentals from time to time.

Here is an easy definition to remember: An alloy steel is a steel in which one or more alloying elements have been blended to give it special properties that cannot be obtained in carbon steel.

Or, here is the metallurgical definition: An alloy steel is one in which the maximum specified content of alloying elements exceeds one or more of the following limits—

Manganese, 1.65 pct; Silicon, 0.60 pct; Copper, 0.60 pct

or in which a definite range or a definite minimum quantity of any of the following elements is specified or required within the limits of the recognized commercial field of alloy steels: aluminum, boron, chromium up to 3.99 pct, cobalt, columbium, molybdenum, nickel, titanium, tungsten, vanadium, zirconium, or any other element added to obtain a desired alloying effect.

As a rule, alloy steel is more difficult to make than carbon steel. There are more elements to be kept within specified ranges and, in general, the ranges of the alloying elements are comparatively narrow; hence the mathematical chances for producing off-heats are correspondingly increased. Moreover, most alloy steels require special reheating and cooling to prevent such imperfections as flaking and cracking.

Surface imperfections must be removed from the billets by scarfing, chipping, or grinding. More exacting methods of testing and inspection are necessary to insure uniformity.

WHERE DOES IT PAY TO USE ALLOY STEELS?

Generally speaking, it is advisable to use alloy steel when more strength, ductility, and toughness are required than can be obtained in carbon steel in the section under consideration. Alloy grades should also be used where specific properties such as corrosion-resistance, heat-resistance, and special low-temperature impact values are needed.

In some cases it requires considerable study to determine when and how to use a particular alloy steel to advantage in a product. Where there is any problem or doubt concerning its use, Bethlehem metallurgists will gladly give impartial advice on analysis, heat-treatment, machinability, and expected results.

In addition to manufacturing all AISI standard alloy steels, this company produces other than standard analysis steels and the full range of carbon grades.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM ALLOY STEELS

BETHLEHEM STEEL

PHOENIX IRON & STEEL COMPANY, Phoenixville, Pa., is one of the nation's oldest steel producers. Above, Phoenix open hearth furnace being tapped by bazooka gun.

Steel, anyone?

Or, for that matter, aluminum, Fiberglas, magnesium?

Name a basic material on industry's shopping list and chances are that one of Barium's 16 integrated companies has a hand in its production or fabrication.

No other steel producer fabricates so many different products. No other processor can match Barium's ability to turn magnesium, the versatile sea-born metal, into basic structural forms. Barium specialists are also breaking new ground in the utilization of Fiberglas for structural applications, such as aircraft shelters and barges.

This close-knit and fully integrated organization of 16 companies offers you a wealth of top-rank engineering talent and extremely flexible production facilities. They can take excellent care of your requirements for structural and fabricated materials, whether routine or highly specialized. We'll be glad to tell you how. Just drop a line on your company letterhead direct to Barium Steel Corporation, 25 Broad Street, New York 4, N.Y.

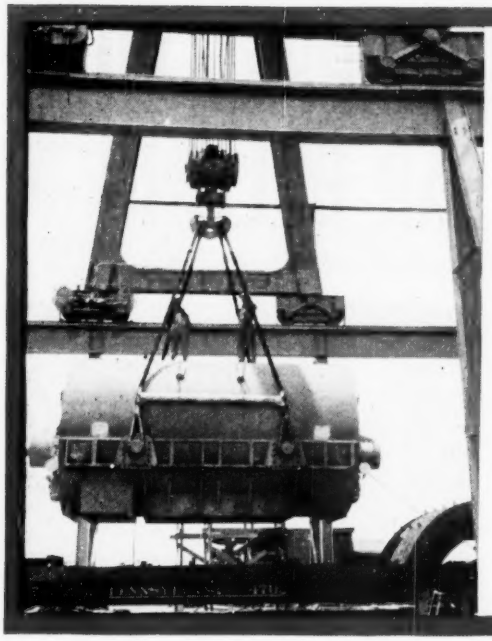
BAYONNE BOLT CORP. • CENTRAL IRON AND STEEL COMPANY • CHESTER BLAST FURNACE • CLYDE IRON WORKS, INC. • CUYAHOGA SPRING COMPANY • EAST COAST AERONAUTICS, INC. • ERIE BOLT AND NUT COMPANY • GEOMETRIC STAMPING CO. • GLOBE FORGE, INCORPORATED • INDUSTRIAL FORGE & STEEL, INC. • JACOBS AIRCRAFT ENGINE CO. • KERMATH MANUFACTURING CO. • KERMATH LIMITED (CANADA) • PHOENIX BRIDGE CO. • PHOENIX IRON & STEEL CO. WILEY MANUFACTURING CO.

3.6

INDUSTRIAL FORGE & STEEL, INC., Canton, O., one of the nation's largest producers of heavy flat-die forgings, works in all types of steels and other metals. Here, titanium is being forged.

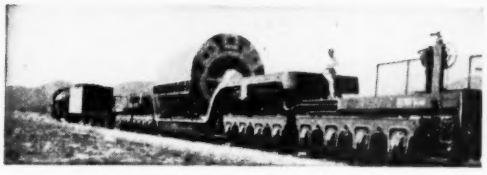
AT 60° BELOW, this air-borne Fiberglas-and-magnesium alert shelter protects planes and crews. Designed and built by Barium's East Coast Aeronautics, Inc., Pelham Manor, N. Y.

DOUBLE CHECK is given a radiator support for an Army truck by inspectors at Geometric Stamping Co., Cleveland, O., which turns out steel and aluminum stampings for industry.



Another job well done with Macwhyte Slings!

408,600-LB. GENERATOR SAFELY HANDLED WITH MACWHYTE ATLAS BRAIDED SLINGS



World's longest flatcar, 129 feet, 16 axles on car support tare weight of 500,400 pounds for car alone. Generator on car weighs 408,600 pounds for a total weight of 909,000 pounds for the car and generator.

180-ton Moffett Crane, proof-tested to 225 tons, makes lift with 1½" Macwhyte Monarch Whyte Strand Wire Rope.

Macwhyte 8-Part Atlas Type 1 Round-braided Wire Rope Sling.

Safe installation of a $2,000,000 generator at the Valley Steam Plant of Los Angeles' Department of Water and Power required expert handling and finest rigging.

That's why Macwhyte Atlas Round-braided Wire Rope Slings were chosen to unload and install the largest and heaviest single freight shipment ever handled by the Southern Pacific Railroad. Lift was made with a 180-ton Moffett Crane using Macwhyte's Monarch Whyte Strand Wire Rope.

Macwhyte's *balanced* braiding gives Atlas Slings greater flexibility, longer life, resists spinning and kinking. Macwhyte slings and wire rope offer better service on any lifting job, large or small. Recommendations will be promptly made on request.

MACWHYTE SLINGS

Complete line of slings to fit your needs!

Three types of body are available: Atlas Round-Braided, Drew Flat-Braided, Monarch Single-Part. All are made to order in any size for any job. Suggestions for slings to meet your needs are promptly available.

READY now—new Circular Number 5308 showing strengths and safe-loads at various angles plus many sling designs. Ask for 5308.

See the hundreds of slings in Macwhyte Sling Catalog S-8

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2912 Fourteenth Ave., Kenosha, Wisconsin

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cable, Safe-Lock Assemblies, Monel Metal and Stainless Steel Wire Rope.

Mill depots: New York • Pittsburgh • Chicago St. Paul • Fort Worth • Portland • Seattle • San Francisco • Los Angeles • Distributors throughout U.S.A.

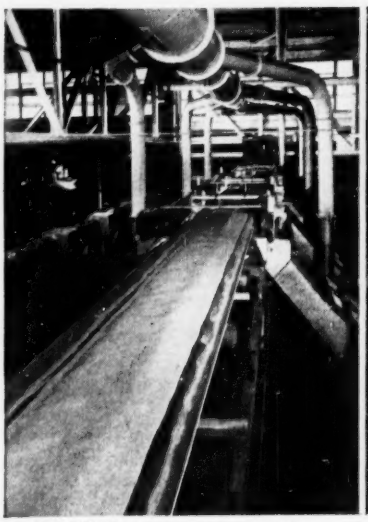
NEW FORD FOUNDRY EQUIPPED WITH 7 MILES OF GOODYEAR BELTING

ONE of the largest and most modern foundry plants in existence, the new Ford Cleveland Foundry, is equipped with Goodyear Conveyor and Elevator Belting—7 miles of it. Many of the belts were spliced by vulcanization on the spot.

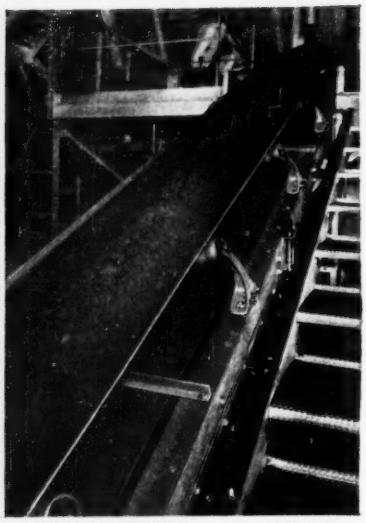
Belting for each installation was specified by the G.T.M.—Goodyear Technical Man—after he was called in by The Cleveland Foundry group, which did all design, layout and engineering for the new Ford plant.

In any foundry operation, it will pay to consult the G.T.M. *first* about belting requirements, for he knows rubber in all its forms better by far—your assurance of long, trouble-free service. You can reach him through your nearest Goodyear Distributor, or by writing:

Goodyear, Mechanical Goods Division, Akron 16, Ohio.



HOT LOADS ride on Goodyear Glass Carcass Conveyor Belting designed to handle materials in the very-high-temperature range.



ABRASION PROBLEMS are met with Style B Goodyear Conveyor Belts. Nearly 32,000 feet of Style B are in use handling abrasive materials.

OILY MATERIALS are easily handled by Goodyear-designed CHEMIGUM Belting—which resists swelling far better than ordinary rubber covers. CHEMIGUM also resists oil far better than many other "oil-resisting" synthetics.

YOUR GOODYEAR DISTRIBUTOR *can quickly supply you with Hose, Flat Belts, V-Belts, Packing, Tank Lining, Rubber-Covered Rolls. Look for him in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."*

Chemigum—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

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This Week in Metalworking

STEEL

Vol. 133 No. 26 December 28, 1953

✓NEWS ✓PRODUCTION-ENGINEERING ✓MARKETS

Metalworking Outlook 19
Past, present and pending events of significance to your industry and to your company

As the Editor Views the News 23

Windows of Washington 34

Mirrors of Motordom 41

The Business Trend 45
Facts and figures on metalworking including the Industrial Production Index and Barometers of Business

Men of Industry 49

Technical Outlook 67

New Alloy: Boost to Turbines, Relief for Stockpiles 68
Timken reduced nickel content of 16-25-6 with no effect on hi-temp strength. Ductility actually improved

Inside Look at Hardening Cast Iron 71
For high quality cast machine parts, you have to watch the physicals and the heat-treat process

Small Parts Handling System 74
Ford uses drop-bottom box and stand to feed parts at work height. Production's up 25 per cent per shift

Progress in Steelmaking 76
Rolls Hot Strip on Planetary Mill—Extremely accurate gages are big advantages at English mill

New Products and Equipment 81

Bugs Are Out of Titanium Casting 88
Finding mold material that would withstand molten titanium was biggest problem at National Research

The Market Outlook 93
Metal Prices and Composites begin on Page 94

Nonferrous Metals 96

Behind the Scenes	6	Obituaries	54
Letters to the Editors	10	Calendar of Meetings	78
Foreign News	38	Helpful Literature	83

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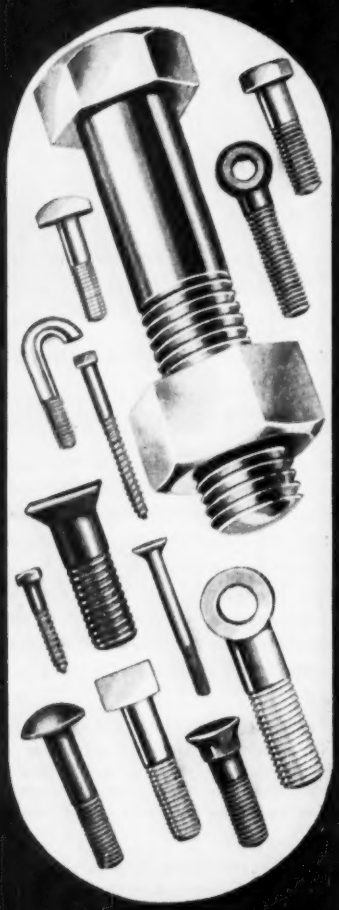
- Alloy Steels
- Stainless Steel
- Silicon Bronze
- Naval Brass
- Monel Metal



You can depend on a uniform Class 3 fit when you buy Pawtucket threaded fasteners. Standard items or specialties — all Pawtucket products are accurately made in standard dimensions or to your specifications. Heat treating with precision-controlled modern equipment.

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T.M. REG.

behind the scenes

How Many Men Must You Sell?

We were passing the time of day with Jim Zuber, business manager, recently when he began to tell of a most interesting study just concluded for STEEL by Market Facts Inc. of Chicago.

The problem being studied was one attempting to determine "Who and how many men must be contacted in any given metalworking plant in order to do an effective selling job." The following very interesting and certainly useful facts were developed. We pass them along to you in the hope that you may be able to relate them to your company's selling problem.

Let's imagine, for example, you are the salesman calling on a prospect like this one: 885 employees; $29,890,000 in sales volume; flat die and drop forgings and steel fabrications are the major products; and plant operations include machining, forging, heat treating, pickling, resistance welding and sand blasting. Careful study of this medium-sized plant's buying pattern would reveal to you that 19 *different men* influence decisions to buy at one point or another. Furthermore, six of these men have moved into their jobs within the past three years (indicating a constantly changing picture).

In one specific purchase, that of a furnace shell, six men participated actively as follows. (1) The master mechanic determined the need; (2) the works manager initiated action and, together with the master mechanic, established specifications; (3) the executive vice president and the comptroller approved the expenditure; (4) the purchasing agent selected the brand and the source of supply; (5) the assistant purchasing agent placed the order.

Market Facts Inc. made detailed purchase order tracings like the one just described in representative small, medium and large plants. While specifics of the pattern differed in number and titles of people involved in the purchase of varied products, the pattern was always the same in the sense that *many* executives worked as a buying team in the purchase of products, equipment and services needed by their plants.

Results of their findings have been incorporated in a brochure entitled "Let's Take a New Look at the Problems You Face in Selling the 1954 Industrial Market."

Should any of you be interested in seeing a copy please address a note to J. W. Zuber, STEEL business manager. He'll be happy to send one to you.

More About the '54 Yearbook

A perennial favorite among *Metalworking Yearbook* features is "Metalworking Facts and Figures." This section, a STEEL original started six years ago, provides metalworking men with hard-to-find statistical data needed by them in the daily performance of their jobs.

The contents of this remarkable 48-page almanac-like work book extend all the way from detailed statistics on raw materials to hundreds of end products used in the industry. More than 400 different metalworking subjects are covered, also related subjects such as labor, prices and earnings.

The sixth edition of "Metalworking Facts and Figures" will be published as part of the 1954 *Metalworking Yearbook* on Jan. 4. Other *Yearbook* editorial "specials" in which you will be interested are: "What Happened in 1953," a record of events in metalworking during the past 12 months; "Calendar of Meetings in 1954," a chronological listing of important meetings and shows with the names and addresses of the sponsoring agencies; "New Products and Equipment," a series of new product and equipment descriptions, illustrated, incorporating an easy-to-use reader service card upon which you can ask for further information about any of the products reviewed.

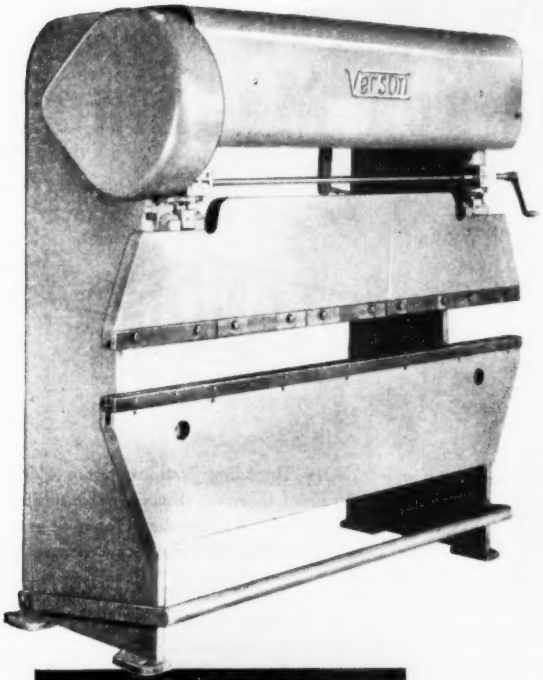
The *Metalworking Yearbook* is a workbook in the most literal sense. It is being written and produced with your needs in mind. Hope you find it as useful as we think you will.

Shrdlu

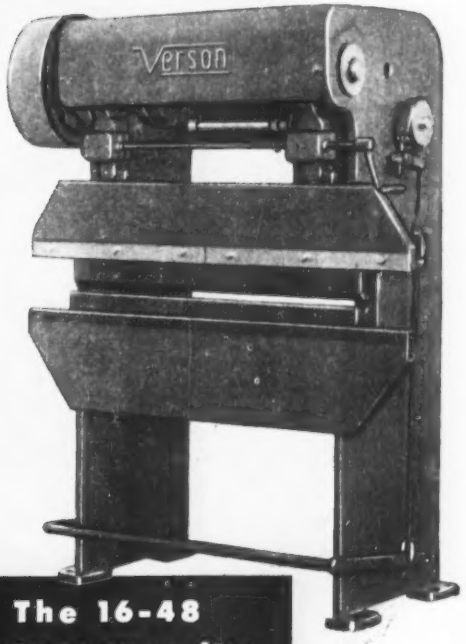
(Metalworking Outlook—Page 19)

Now, for the first time...

Standard Verson Press Brakes Available from *Stock!*



The 1062
25 tons capacity
(16 ga. x 78")
$2,190.00 as shown



The 16-48
15 tons capacity
(16 ga. x 48")
$1,455.00 as shown

Standard Dies Also Available

Standard 90° "V" dies for these press brakes are also available from stock. 78" long set for the 1062 is priced at $124.00. 48" long set for use in the 1062 or 16-48 is priced at $93.00. (Prices are for dies to handle 16 ga.).

To meet the demand for quality press brakes at modest cost and available for prompt delivery, Verson now offers two standard models *from stock*. For the small shop, it means big press standards of design and construction at prices that will fit almost any budget. For the larger shop, it means an economical answer to handling the smaller jobs without tying up big expensive machines.

Important, too, is the fact that you can order these machines as easily as buying an automobile. There is no involved proposal . . . no long delay awaiting delivery. These standard machines are offered at a standard price and shipped from stock.

Your Verson dealer can give you further information or write direct.

A Verson Press for every job from 60 tons up

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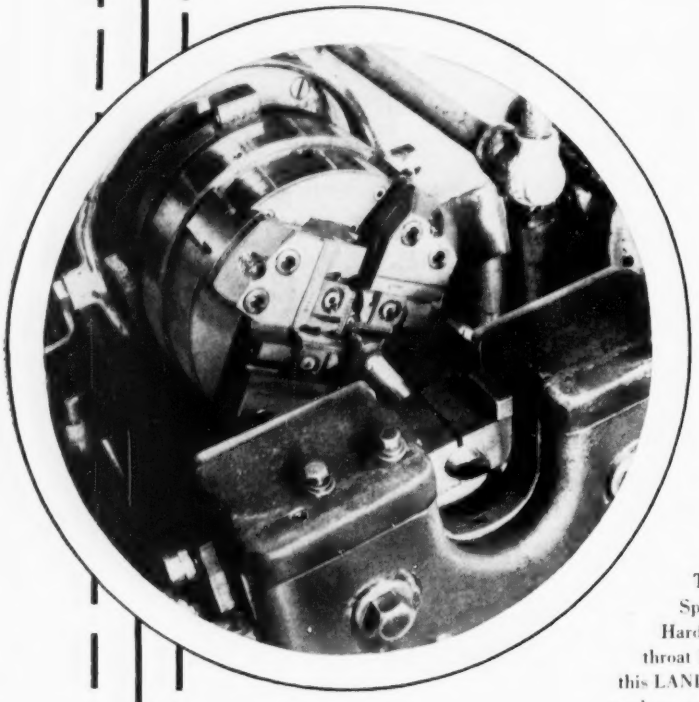
threaded to ±.001

on a Landmaco Machine



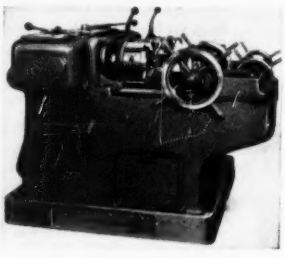
LANDIS
REG. U.S. TRADE — MARK PAT. OFF.

Using LANDIS Threading Equipment, the Chicago Screw Company of Bellwood, Illinois, is able to thread connecting rod bolts to better than Class 4 fit at normal production rates and economical tool cost.

Bolt blanks are of 8640 steel of 30-36 Rockwell "C" hardness. 11/16" diameter 16 pitch UN form threads must be cut 1 7/16" long over a cotter key hole. Specifications required a ±.001" tolerance on the Pitch Diameter of the thread, and finished threads are closely inspected for concentricity.

To perform this operation a 1½" LANDMACO Double-Spindle Threading Machine equipped with Leadscrew, Hardened and Ground LANCO Heads, and Chasers of special throat length and hardness was installed. In normal production, this LANDMACO Machine regularly completes 127 threaded pieces per hour cutting at 15 surface feet per minute. On an average 400 threads per head are produced between each regrinding of the chasers.

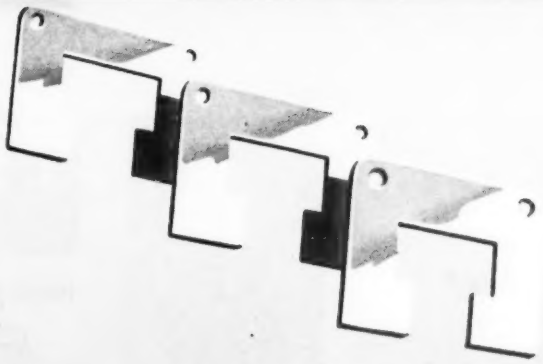
This installation illustrates the production advantages of LANDIS Equipment for difficult and exacting threading operations. The mechanically-controlled positive feed of the Leadscrew, the maximum rigidity of Die Heads designed for precision threading, and Chasers of special specifications—allow threading hard material with minimum cutting strain. As a result, threads are produced to close tolerances at economical production rates and low tool cost.

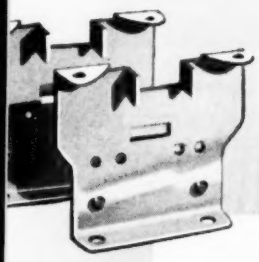


For further information, ask for Bulletins H-75 (LANDMACO Machines) and F-80 (Hardened and Ground Heads). Please send specifications when writing.

LANDIS Machine COMPANY
WAYNESBORO, PENNSYLVANIA

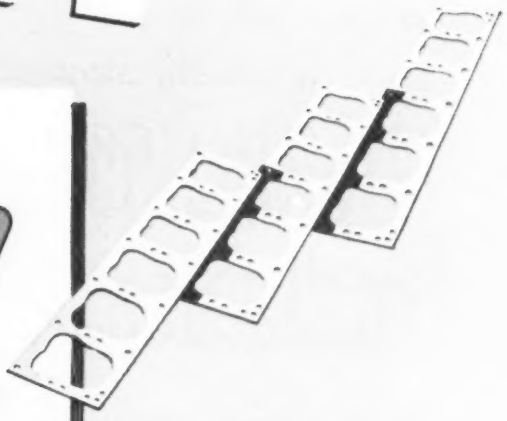
387





Weirzin

ELECTROLYTIC ZINC-COATED STRIP



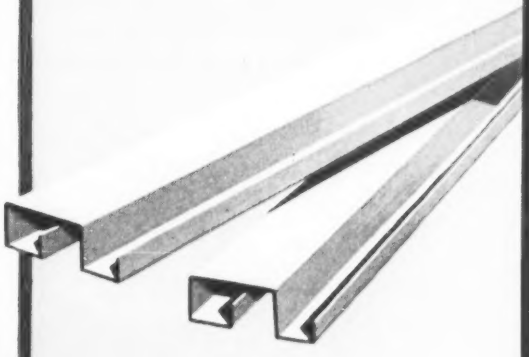
Cuts manufacturing costs!

- Speeds production
- Increases die life
- Reduces die maintenance

From the first day you use Weirzin you will find a marked reduction in manufacturing costs. Your production rate will increase with less time spent on die maintenance and replacement. The tight zinc-coating, electrolytically applied to Weirzin steel, actually lubricates dies without leaving a zinc deposit—thereby reducing die maintenance expense and lengthening die life.

One fabricator reported a 300 per cent increase in production per set of dies after changing to Weirzin from ordinary carbon steel. This is an economy factor too great to be ignored.

Add to this the fact that the zinc coating on Weirzin will not flake, peel or powder under the most severe fabricating operations and you will quickly realize what production economies Weirzin has to offer. Write today for further information on how Weirzin can cut your manufacturing costs—and make your product a better one.



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At dip tanks,
switch gear,
transformer vaults.

Your safest move is to
install a KIDDE
fully Automatic CO_2
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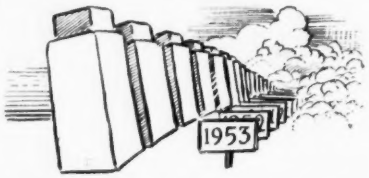
LETTERS TO THE EDITORS

History of Steel Output



We would appreciate your referring to us whatever material you have on file showing the history of ingot production in the U. S. for the past 40 years. We are interested in plotting the curve of average annual ingot production as part of our business forecasting process.

W. B. Miller
General Electric Co.
Erie, Pa.

• *Production in net tons was as follows:*

1952	93,168,039	1929	63,205,490
1951	105,199,848	1928	57,729,481
1950	96,836,075	1927	50,327,407
1949	77,978,176	1926	54,089,014
1948	88,640,470	1925	50,840,747
1947	84,894,071	1924	42,483,772
1946	66,602,724	1923	50,336,940
1945	79,701,648	1922	39,875,277
1944	89,641,600	1921	22,157,853
1943	88,836,512	1920	47,188,886
1942	86,031,931	1919	38,831,779
1941	82,839,259	1918	49,797,923
1940	66,982,686	1917	50,467,880
1939	52,798,714	1916	47,906,522
1938	31,751,990	1915	36,009,161
1937	56,636,945	1914	26,334,594
1936	53,499,999	1913	35,056,979
1935	38,183,705	1912	35,001,459
1934	29,181,924	1911	26,517,238
1933	26,020,229	1910	29,226,309
1932	15,322,901	1909	26,829,624
1931	29,058,961	1908	15,706,037
1930	45,583,421		

Citing Special Shows

We certainly appreciated your excellent story "Special Shows Sell" (Dec. 7, p. 95). Your article covered the show in its entirety. Would you please send us 25 copies.

H. C. Bothe
Production Service Co.
Cleveland

. . . please send us two tear sheets of the article "Special Shows Sell."

R. W. Minnich
F. T. Griswold Mfg. Co.
Devon, Pa.

. . . please send us two tear sheets.

O. R. Teruzzi
Fairfield Tool Co. Inc.
Bridgeport, Conn.

. . . we would be grateful for six tear sheets.

Fred Schoop
Alina Corp.
New York

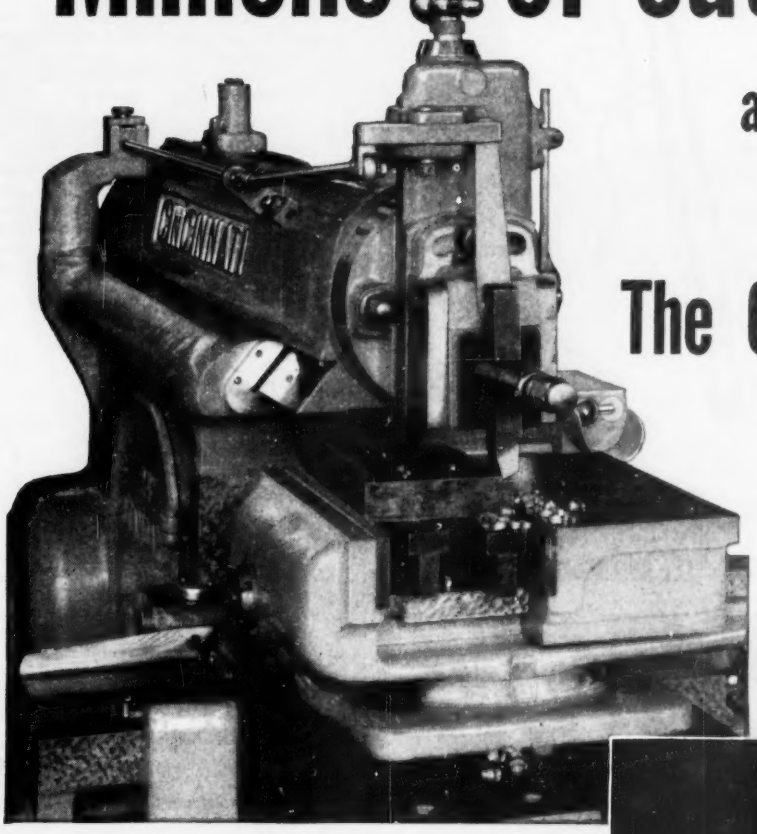
• *Sent.—ED.*

No Charge for Service

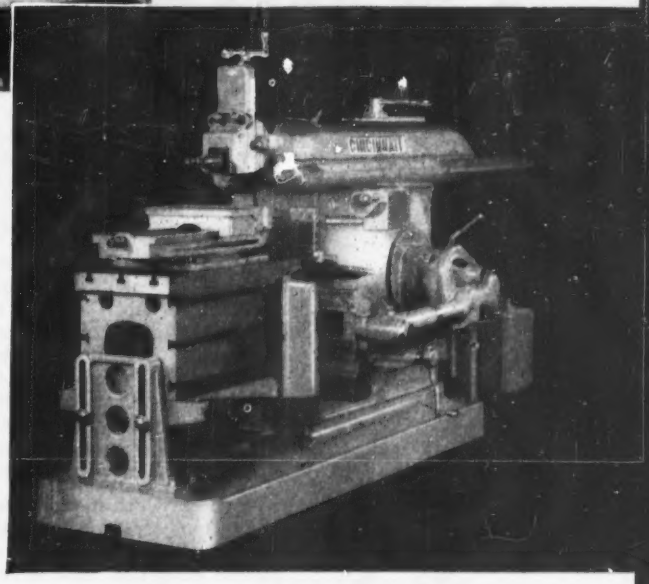
On occasion we see articles in STEEL which we would like to circulate among our personnel to be kept for their reference. I note in your "Letters to the Editors" column many requests

Please turn to p. 12

Millions of cuts without a fault...



The CINCINNATI Tool Lifter!



The dependable Cincinnati Tool lifter, with positive return and lift, eliminates tool damage—operates at high speeds—and with angular settings of tool slide or clapper box. Protects and permits use to maximum advantage of carbide or high speed cutting tools.

After simple setting it is automatic, relieves operator and increases production.

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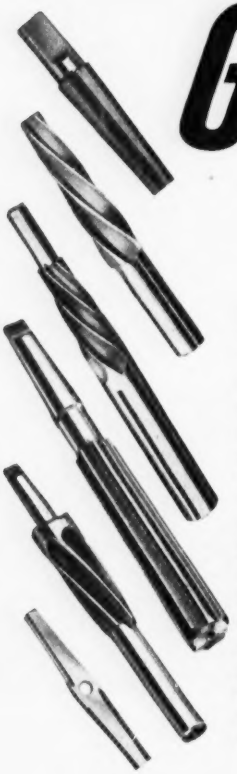

They may not *look* alike, but all of the special tools on this page share a common function . . . *because every one is a reamer!* Each was engineered and manufactured by Gorham Tool Company to provide a practical solution to a specific production machining problem for one of our customers.

Actually, these reamers represent just a few of the many special-purpose cutting tools produced by Gorham. Others include milling cutters and end mills, inserted blade cutters, flat and circular form tools, profile cutters, and carbide tipped tools of every description. Gorham "specials" are turning problems into profits in thousands of plants every day . . . and the one we engineer for you will solve *your* next production machining problem, too! Take advantage of our experience.

Your nearby Gorham Field Engineer is a qualified cutting tool expert in both practical design and actual application, and his assistance is yours without obligation. Just write for his name, or send details of your problem direct to us. We'll have him get in touch with you promptly.

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WEST COAST WAREHOUSE: 576 North Prairie Ave., Hawthorne, Calif.

LETTERS

Concluded from p. 10

for tear sheets but no listing of the charges for such tear sheets. We would like to obtain 10 tear sheets of the article "Smooth Out Your Disc Grinding Problems" (Nov. 2, p. 92).

A. H. Smith
Thompson Trailer Corp.
Pikesville, Md.

• *Sent. Tear sheets of articles in each issue of* STEEL *are available in limited numbers from the over-run on a while-they-last basis. Quotations on large quantity reprints of particular articles may be had from* STEEL*'s Readers' Service Department.—ED.*

Handling Standardization

I was interested in your mention in the article "Washington Talk" (Nov. 9, p. 111) of the way in which the military standardization program is being handled. Can you furnish me with any more dope on this subject?

John C. Sears
executive secretary
American Gear Manufacturers Association
Pittsburgh

• *Write to W. S. MacLeod, director, Standards Division, Federal Supply Service, General Services Administration, Washington.—ED.*

In the Interest of Education

A lecture which I delivered at the Symposium on Abrasives at Alfred University in June, 1953, included an illustration taken from STEEL. It has since been suggested that I publish the paper. Before doing so, however, I wish to obtain permission to use the figure in question.

The picture I would like to use is Figure 1, Mar. 17, 1947, p. 94.

H. R. Letner
senior fellow
Mellon Institute of Industrial Research
University of Pittsburgh
Pittsburgh

• *Permission granted.—ED.*

Handbook Has the Answers

During a recent technical meeting, one of the people present was able to supply all of the necessary specifications on various metals; and your "Specifications Handbook" made quite an impression on all present since that is where he was procuring the information. Since we are subscribers to STEEL, we would appreciate receiving two copies of the handbook.

R. P. Jensen
National Lead Co.
Chicago Branch
Detroit

• *Sent.* STEEL*'s Specifications Handbook has been published as an additional service to subscribers and is available to subscribers for $2.00 per copy. —ED.*

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Shows you how to get
Spherical Roller
Bearing capacity
Up 25% to 50%
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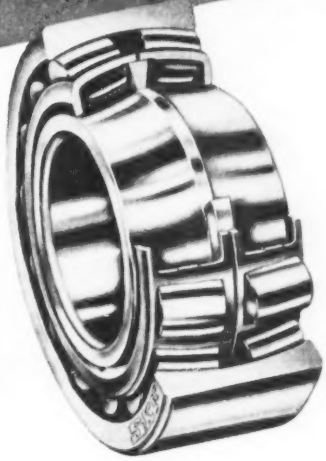

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We'll send your copy as soon as you request it. Just write our nearest office or 4957 Stenton Ave., Philadelphia 44, Pa. and ask for Catalog TD2-625(1).

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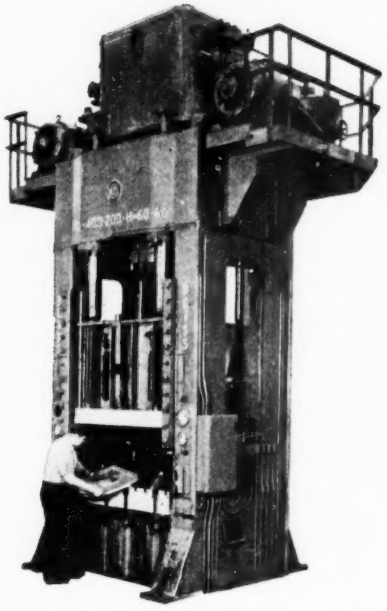
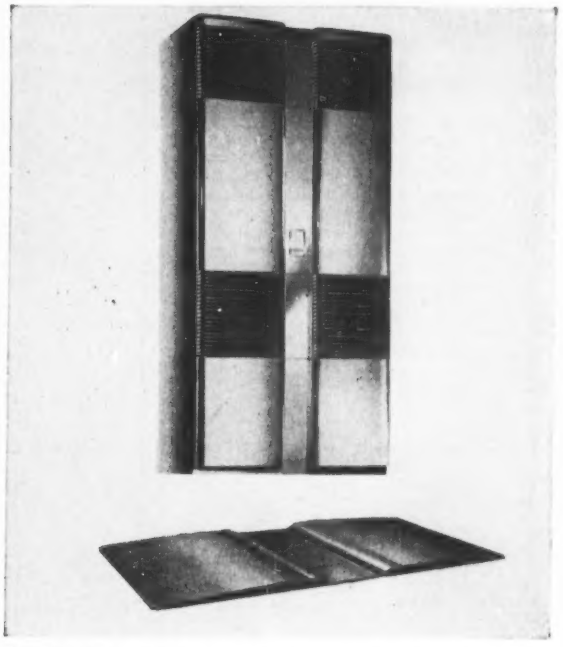
The trend is to more stampings WITH BLISS PRESSES...



1200 14-gauge drip pans are drawn and formed daily in this Bliss press which has a 200-ton blankholder pressure and 400-ton plunger capacity.



Hard-to-make contours in this center-section stamping for a Weathermaker are drawn from 20-gauge steel at the rate of 1800 daily.

Versatile Bliss Hydro-Dynamic Allows Unusual Metal Design

A new 600-ton Bliss double-action Hydro-Dynamic press helps Carrier Corporation produce nice-to-look-at but tough-to-make contours for its line of air conditioners.

Carrier's Vice President of Manufacturing reported that, "By varying ram, blankholder and cushion pressures and the draw cycle, we have been able to complete difficult drawing operations with sharp corners and small radii at the bottom... Actually, the press has exceeded our expectations."

Top performance? Of course—but it's all a matter of picking the proper press. It's what Bliss engineers mean by "the *right* press for the job."

Top panel for window-model Room Air Conditioner has intricate contours, sharp corners and bottom radii. Yet Carrier was able to produce them at the rate of 1200 per eight-hour shift.

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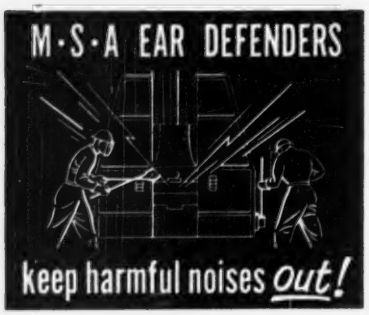

If your workers "can't hear themselves think," chances are *you'll* hear about it in lowered production and damaged hearing.

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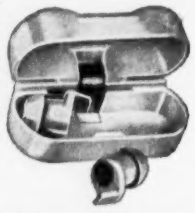

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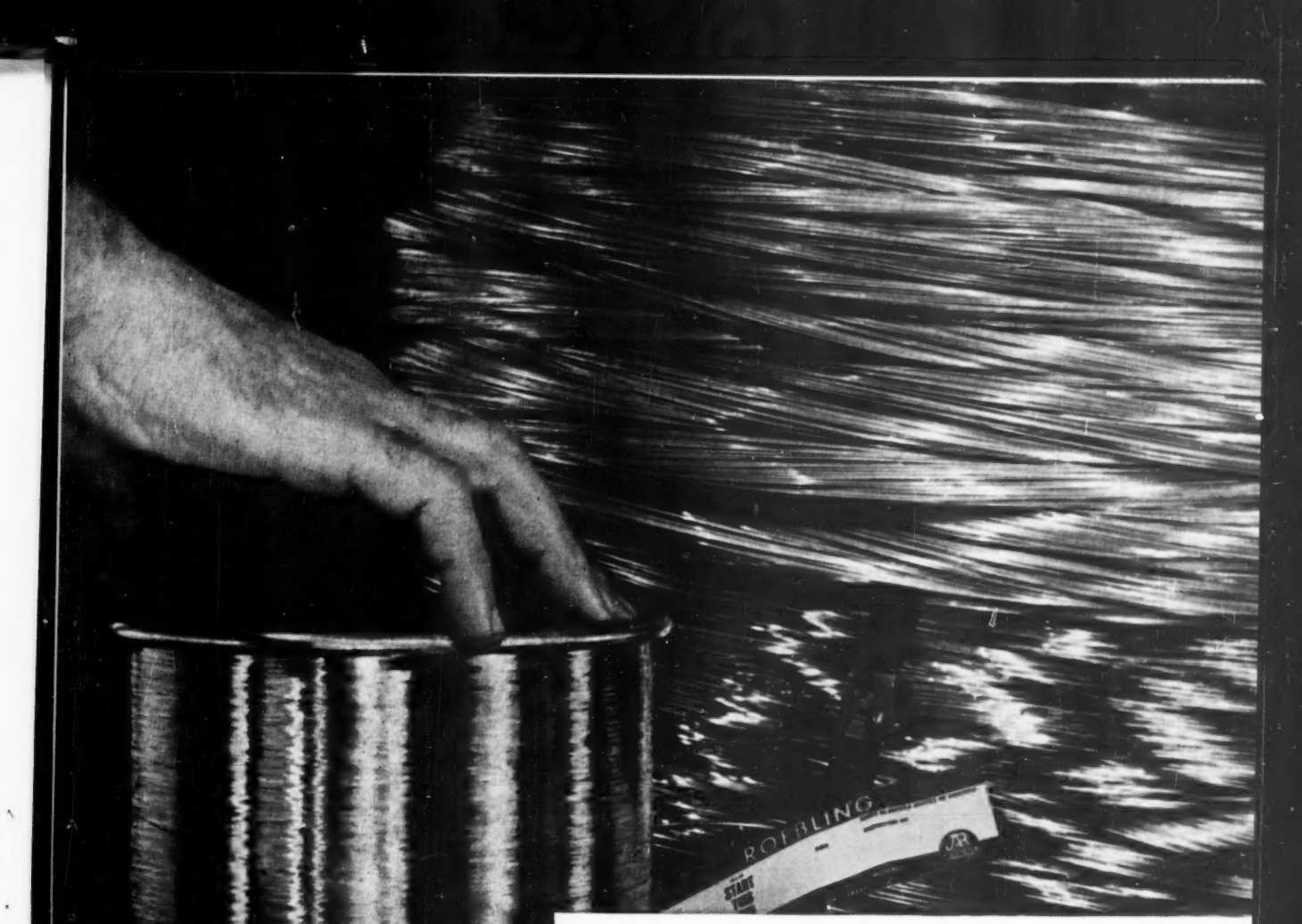

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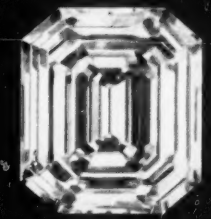

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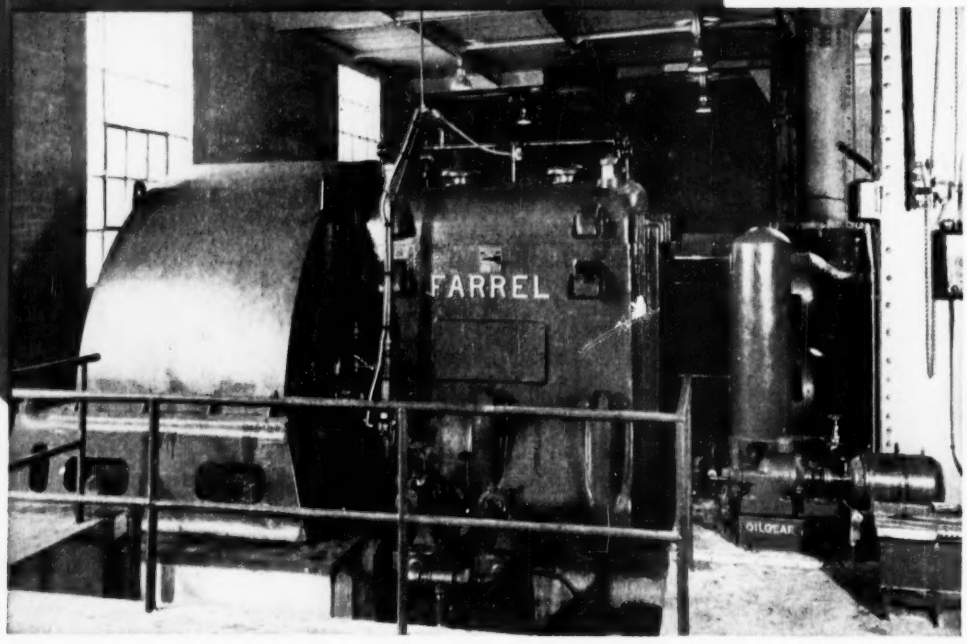
THE CASE OF THE MISSING GEAR WEAR



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Texaco Meropa Lubricant has especially sturdy EP characteristics as well as notable resistance to oxidation. It stands up under heavy loads and severe operating conditions; does not thicken or foam. *Texaco Meropa Lubricant* has fine adhesive properties, is not affected by moisture, will not corrode gears or bearings. It does not separate in service or storage.

In roll stand circulating systems, use *Texaco Regal Oil*. It's a heavy duty, turbine-quality oil that separates easily from water, resists oxidation and sludging, keeps systems clean.

A Texaco Lubrication Engineer will gladly help you simplify and improve lubrication throughout your mill. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Meropa Lubricants

FOR STEEL MILL GEAR DRIVES

TUNE IN . . . METROPOLITAN OPERA radio broadcasts every Saturday afternoon. See newspaper for time and station.

STEEL
December 28, 1953

Metalworking Outlook

Autos Are the Key

Steelmakers, as well as automakers, are anxiously gaging the public's reception to the new car models. If the new cars sell at a good rate, orders from automakers should pick up in February and March. Ford and General Motors are ordering almost as much steel as they did last year. Chrysler and the independents are lagging. GM, which until early this month was keeping about a 15-day steel inventory, is now building up 25-day stocks.

NLRB Changes Its Tune

The National Labor Relations Board is coming around. As is the case with many other Washington commissions and boards, the Republicans are gradually moving into power. Proof in NLRB is last week's decision to prohibit prounion talks by labor leaders on an employer's own property. The major reversal of policy also prohibits either side from making talks on company premises 24 hours before a board election. Reversal of the speechmaking rule was decided by Chairman Guy Farmer and member Philip Ray Rodgers, two Eisenhower appointees, with a concurring opinion from member Ivar Peterson, a Truman appointee. Truman appointee Abe Murdock was the lone dissenter. The fifth seat on the board is still vacant.

Brotherly Love?

The much-publicized mutual-aid pacts between separate unions suffered a setback during the aviation strike. AFL's International Association of Machinists and the CIO's United Auto Workers had signed such an agreement. After 52 days UAW finally came to terms with North American Aviation Inc. for a 4-per-cent hike, exactly what NAA originally offered. UAW partly attributes its defeat to IAM's early settlements close to NAA terms with other aircraft companies. Publicly UAW isn't saying much, but privately it's irked.

For Industrial Peace

After a seven-year study of the causes of industrial peace, National Planning Association has this advice: Keep lawyers away from bargaining tables; don't waste time arguing over principles, but settle the problems at hand; don't meddle in the union's internal affairs or try to destroy workers' allegiance to their union; get grievances settled promptly.

Overtime: On the Downtrend

Although Ford Motor Co. says it's going to continue its present schedules of overtime in the first quarter, look for the trend to be down in most companies, even during the next three months. Executives figure that a drop from 48 to 40 hours per week means a 10-per-cent saving in payroll

The Technical Outlook—p. 67 The Market Outlook—p. 93

costs. The number of hours worked per week in factories averaged 40.6 for the first ten months of 1953. For 1954 the average will probably be between 38 and 40 hours.

Battle Against Subversives

Look for legislation in 1954 to make it easier to get subversive and other security risks out of defense plants. Bills are being prepared on the House side by Charles J. Kersten (Rep., Wis.) and on the Senate side by the Jenner Internal Security Subcommittee. The intent of proposed legislation is to place in the Justice or Labor departments responsibility for investigating disloyalty charges and for firing disloyal workers. An appeals board to protect innocent workers is included in the proposals.

U. S. Statistics Hit

The Commerce department's construction figures are under attack. Representatives of the building materials and construction industries claim that they are inadequate and that they have led to many ill-advised investments in the building of both residential and commercial property. The industry people want Commerce to compile a real estate price index based on selling prices rather than costs, data on demolitions, data on real property inventory, data on total volume of real estate sales and more up-to-date information on building materials production and construction activities.

Straws in the Wind

Steel Products Industry Advisory Committee recommends to Business & Defense Services Administration that small defense subcontractors be permitted to self-authorize their orders for controlled steel mill products . . .Westinghouse Electric Corp. has abandoned its proposed glass plant near Hot Springs, Ark. . . .General Electric Co. expects its sales in 1954 again to surpass the $3-billion mark. . .Two hundred forty-five new-type box cars equipped with "cushion ride" freight car trucks designed by Chrysler Corp. have been ordered from Greenville Steel Car Co. by six railroads for spring delivery.

This Week in Metalworking

U. S. stockpiling policies and an expected business upturn make it touch and go in nickel for civilian users (p. 27). . .The radio-electronics-television industry wired up a banner year in 1953 (p. 29). . .For tips on building your new plant, see p. 30. . .BDSA seeks advice from industry advisory committees whose membership for the first time will include representatives from business papers and trade associations (p. 32). . .The U. S. is grinding the finishing touches on its machine tool policy (p. 33). . .A study by Machinery & Allied Products Institute shows that equipment is still a good buy pricewise (p. 37).

Installed by Westinghouse Distributor, J. P. Salmini Company, Bridgeport, Connecticut

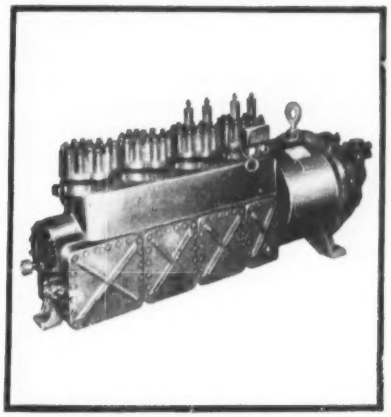
EVER WONDER HOW ALUMINUM GOT THAT WAY?

Most aluminum products must be corrosion-proof and scratch-resistant. Yet aluminum is basically a very soft metal. It gets its hard finish by anodizing. Immersed in sulphuric acid, the surface builds up a tough coating through electrolysis.

But the chemical reaction heats up the acid. If the bath gets too hot, the coating gets too soft. Result: rejects and lost man-hours.

At Scovill Manufacturing Company they consistently achieve a hard, uniform finish. The temperature of the acid bath is kept at an even 70° by a Westinghouse refrigeration compressor. It provides chilled water circulated through pipes to absorb the excess heat.

If you have a process—or a product—which can be improved by refrigeration get in touch with Westinghouse. Chilled water or conditioned air can solve a lot of production problems. Call the Westinghouse Air Conditioning Distributor in your 'phone directory, or write Westinghouse Air Conditioning Division, Hyde Park 36, Mass.



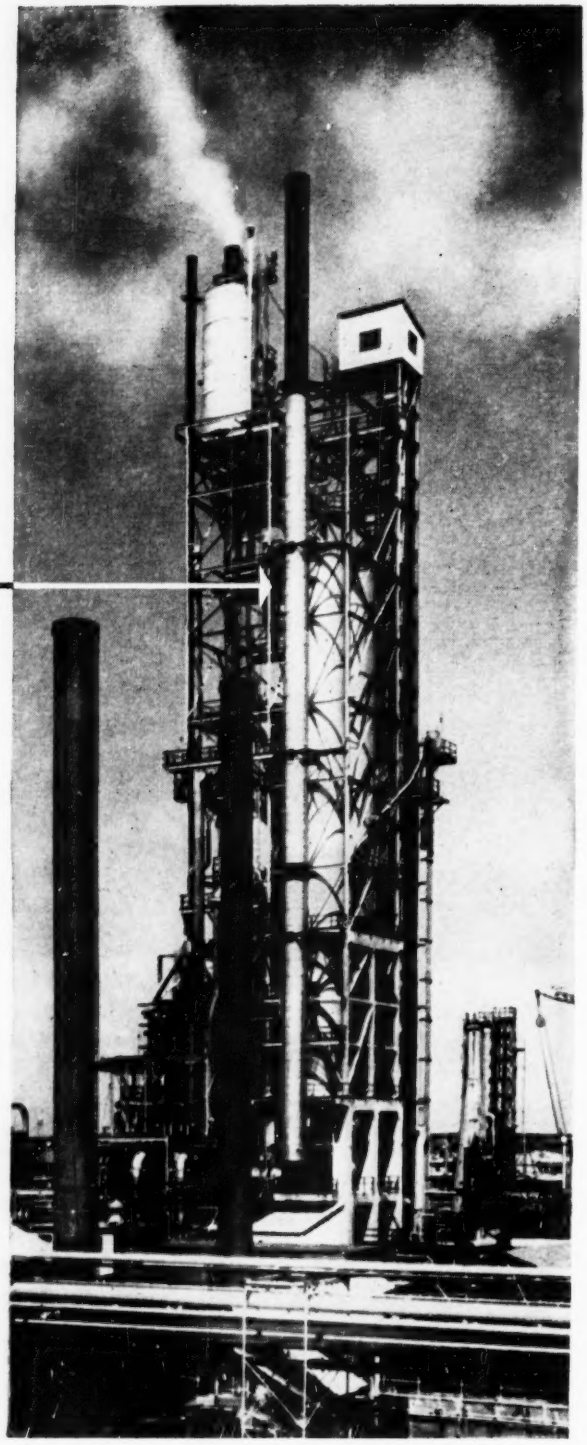
This is the compact, lightweight compressor which makes this uniform process possible. And it does it efficiently. No belts, pulleys or shaft seals to give trouble. Because of its hermetically-sealed design, it cools itself with the refrigerant it pumps!

WESTINGHOUSE AIR CONDITIONING

YOU CAN BE SURE... IF IT'S **Westinghouse**

J-80331

How Armco ALUMINIZED Steel Solved a Contraction Problem



An Armco ALUMINIZED Steel raincoat for a stack

Before this stack connected with a high-temperature fractionating column was sheltered by a rain-shield made of Armco ALUMINIZED* Steel, driving Gulf Coast rains were a serious hazard. The stack operated normally at 700 degrees F, but semi-tropical rains would cool the windward side down to 300 to 400 degrees F, while the lee side of the stack remained at operating temperature. Uneven contraction would cause the stack to bow.

SOLVED CRACKING PROBLEM

Structural supports were rigid and would not permit much movement of the stack. Yet something had to give, so cracking of the stack was an ever-present threat. To protect the stack from failure, it was fitted with a shield of Armco ALUMINIZED Steel with an airspace between shield and stack. This protected the stack from wind and rain, prevented uneven contraction and solved a serious problem for the oil refinery.

HEAT- AND CORROSION-RESISTANT

Its combination of heat- and corrosion-resistance makes Armco ALUMINIZED Steel ideal for many applications like this. At temperatures up to 900 degrees F it is used for heat reflection; at higher temperatures it becomes an excellent radiator of heat.

For more information on this special aluminum-coated steel, phone the nearest Armco District Office or write us at the address below.

See our catalog in "Sweet's Product Design File" for information on the other Armco Special-Purpose Steels.

ARMCO STEEL CORPORATION

4903 CURTIS ST., MIDDLETOWN, O. • EXPORT: THE ARMCO INTERNATIONAL CORPORATION

ARMCO

*® U. S. PAT. OFF.

A Year of Change

As we approach the end of 1953, it is difficult to dismiss it from our minds without recounting how many times events in this really remarkable year have caused men in high and low places to change their minds, alter programs or even reverse important policies.

A year ago, when we were on the threshold of the new 1953, persons identified with the metalworking industry were chiefly concerned with two major probabilities in the new year. One was the hope that a change of administration in Washington would bring an overdue retreat from too much federal government activity, excessive bureaucracy, too much deficit spending, atrocious tax burdens and too many "give away" programs. This hope was predicated to a large extent on previous experience that a new broom sweeps clean.

The other probability was that the boom that had been pyramiding since the beginning of the Korean war would fade fast in 1953 and that a buyers' market would soon replace the sellers' market of recent years.

Let us consider these probabilities in reverse order. The shift from a sellers' market to a buyers' market either is in process or has been accomplished, depending upon the line of business in which one is engaged. The significant factor, however, is that the turning point came later than most people expected. Similarly, in the forecasts for 1954, practically all prognosticators are revising their predictions upward as the new year approaches.

As to the new broom in Washington, events of 1953 proved that the accumulation of 20 years of New Dealism and Fair Dealism is much, much more than can be swept out overnight even with the best of new brooms. In the early days of 1954, the President in his "state of the union," budget and economic report messages to Congress will indicate the extent to which his administration has been forced to change its original program because of the unexpected stubborn resistance of ingrained practices introduced into the federal government during 20 years of socialistic paternalism.

These three messages, coupled with the four-power conference, should make the first weeks of 1954 hectic ones.

Happy New Year!

E. C. Shaner

EDITOR-IN-CHIEF

EQUIPMENT BEST BUY: Machinery & Allied Products Institute has compiled statistics which show convincingly (p. 37) that production equipment is one of the best investments that a manufacturer can make. In fact, it is a "better buy" than a new plant.

These conclusions are based upon a study of changes in hourly wages, cost of plant construc-

tion and cost of production equipment from 1900 to 1953. On the assumption that values for 1900 in all three series equal 100, hourly wages increased during this more than half a century by slightly over 1000 per cent, the cost of plant construction by 540 per cent and the cost of production equipment by only 370 per cent.

These figures must be doubly reassuring to manufacturers who, according to recent surveys, are planning plant and equipment purchases in 1954 only slightly below those of the best year to date. That a dollar spent for efficient productive facilities goes so much farther than a dollar laid on the line for some other things is a good thing to know.

* * *

REAL PLANT DISPERSAL: One of the most fascinating problems confronting a new manufacturing enterprise (p. 30) is that of deciding where to establish the plant. This observer has been quite impressed by the tendency among new, small manufacturers to go out into the country where there are not even railroad sidings. One of the most successful manufacturers in a highly selective field has recently established a new manufacturing subsidiary, and its productive facilities are at a rural address that nobody recognizes and in a location at least 15 miles from any railroad connection. The main reason why anybody knows about the existence of this company is that the several county seat weekly newspapers in the area ran ads for machinists for the plant, which really is in the oversized barn of a local farmer.

This is plant dispersal far beyond anything that federal officials in Washington have contemplated or demanded.

* * *

METALLURGIC MIRACLE: Twelve years ago Timken Roller Bearing Co. introduced an alloy steel containing 16 per cent chromium, 25 per cent nickel and 6 per cent molybdenum which has proved highly satisfactory for use in airplane superchargers, jet engines and gas turbines where high temperatures are encountered.

More recently, Timken metallurgists began to realize that if any of these uses—such as small gas turbines, for instance—should expand rapidly and should require a sharply increased tonnage of "16-25-6," the resultant drain upon the nation's supply of nickel might be serious in an emergency. Therefore they began looking for ways to reduce the nickel content. They finally developed (p. 68) a "16-15-6" alloy which, while requiring 40 per cent less nickel, has high temperature strength equal to that of the "16-25-6" alloy and is superior to its predecessor in ductility.

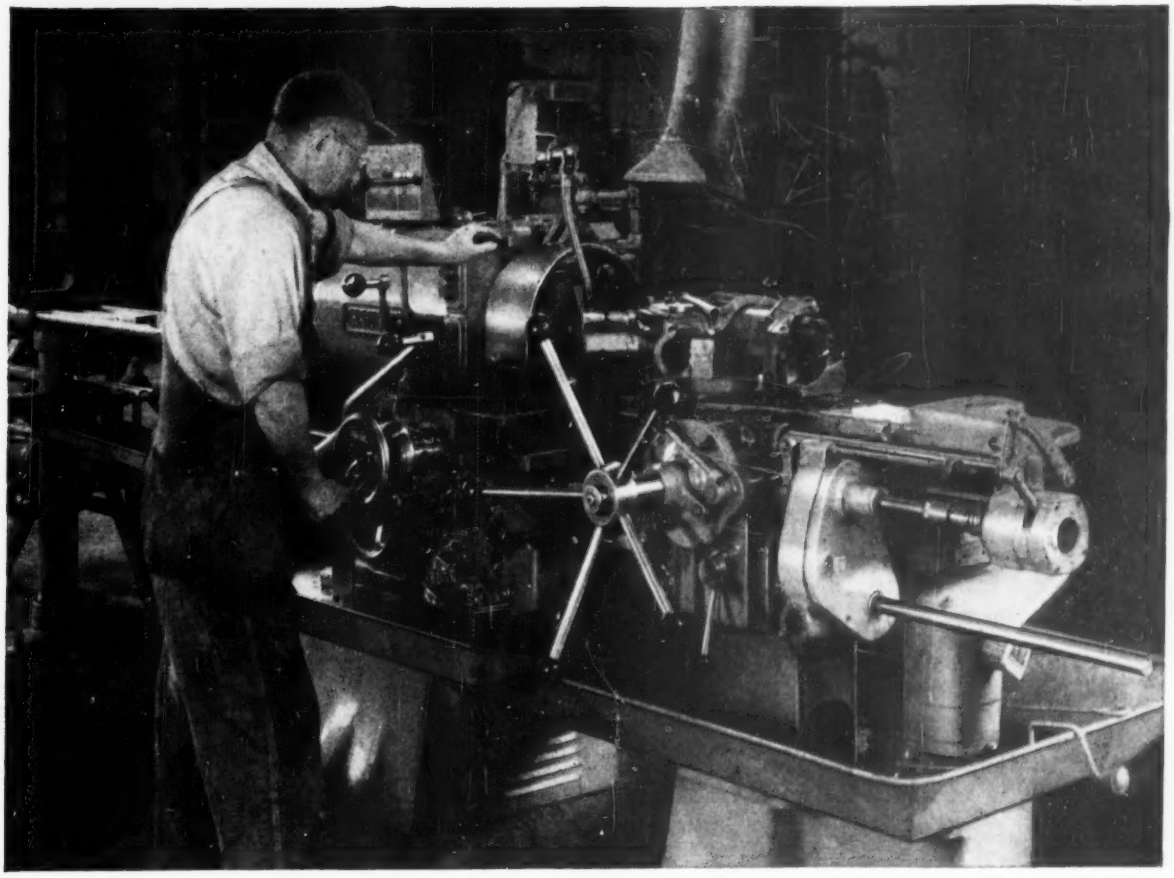
* * *

A PROTECTIVE DEVICE: Here is a problem that merits careful consideration. During the postwar years more and more ocean vessels of European registry have been coming into Great Lakes ports to deliver goods to American buyers or to transport American goods to overseas buyers. Thus far, no one has opposed this trade. However, there is a feeling among some Canadian and American vessel operators that these foreign-owned vessels may expand their trade from one Canadian or American port to another. The European scale of wages is much lower than that of the Canadian and American. The point has been raised by legislators in the states and in the dominion that foreign vessel operators be prevented from taking cargoes from one Great Lakes port to another. This would preserve an adequate fleet of United States and Canadian vessels to care for the needs of each nation.

* * *

ENDS ON CHEERY NOTE: Fortunately the memory of the now rapidly fading year of 1953 will be improved in our minds by virtue of the late but welcome decision of the men in the Kremlin to be willing to engage in secret discussion with representatives of other nations on problems of atomic power as proposed by President Eisenhower 12 days earlier. Of course it would be unwise to place too much hope on the outcome of the Soviet's willingness to talk, but their acceptance is significant.

It indicates that even in the minds of the chieftains in the Kremlin, the strength of world opinion is recognized to be so strongly and so unitedly in favor of the objectives of the Eisenhower proposal that no power—not even Russia—dare be foolish enough to turn it down flatly. There is reason for encouragement in that recognition.



MACHINING FOR GOLD at Homestake

with Gisholt Turret Lathes

Yes, gold mining means machinery. And here at the famous Homestake Mine at Lead, South Dakota, Gisholt Turret Lathes help to machine the machines that dig for gold. It's a big job, too—turning out the variety of rock bits and drill rods that are used up in large numbers.

This Gisholt Ram Type Lathe was first used to turn the plain ends on the one-inch quarter-octagon drill steel for two types of rock bits. Production averaged 30 an hour. Now, the machine is also used to machine and thread three sizes of forged steel drill rods. Besides all this, the Gisholt has the job of facing and chamfering the chuck, or shank ends, of the drill steel so that a perfectly flat face is hit by the drill machine tappet.

Here, again, Gisholt Ram Type Turret Lathes prove their easy change-over and ability to produce profitably, even on small runs—big assets in any machine shop. Ask your nearest Gisholt representative about them. Or write us.

GISHOLT
MACHINE COMPANY
Madison 10, Wisconsin

THE GISHOLT ROUND TABLE
represents the collective experience of specialists in machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

Saves time...money

All steel from one source

When you combine all your steel requirements on a single order to Ryerson you cut costs in many ways. One call—one order—save purchasing time and you also simplify bookkeeping—reduce clerical expense.

In addition, combining most carbon steel purchases under the Ryerson quantity differential plan brings further savings. And with larger quantities you often effect substantial reduction in freight on long hauls.

All these economies are possible when you call Ryerson for steel because Ryerson stocks are the world's largest and most diversified. Carbon steel, alloys, stainless—no matter what analyses you need, no matter what shapes and sizes, you can be practically certain of getting them all with just one call to Ryerson.

You can be sure of prompt delivery, too. So next time you need steel, no matter how many kinds or sizes, call your nearest Ryerson plant.

PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled & cold finished
STRUCTURALS—Channels, angles, beams, etc.
PLATES—Many types including Inland 4-Way Safety Plate
SHEETS—Hot & cold rolled, many types & coatings
TUBING—Seamless & welded, mechanical & boiler tubes
ALLOYS—Hot rolled, cold finished, heat treated
STAINLESS—Allegheny bars, plates, sheets, tubes, etc.
REINFORCING—Bars & Accessories, spirals, wire mesh
BABBITT—Five types, also Ryertex plastic bearings
MACHINERY & TOOLS—For metal fabrication

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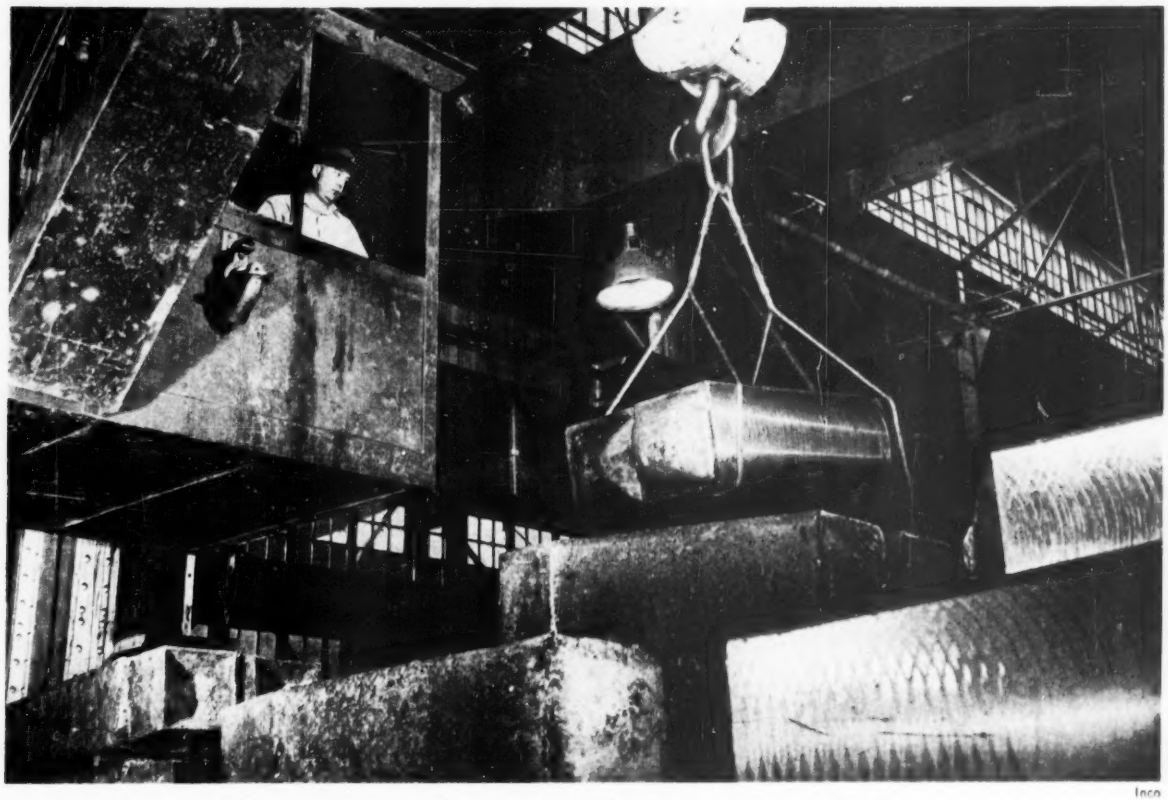


Inco

U.S. stockpiling and an expected business upturn make it . . .

Touch and Go in Nickel for Civilian Consumers

LONG-SUFFERING nickel users are in for another siege of shortage unless the government revamps its present stockpile schedules.

"There is a very real probability that industry will have to get along with a substantial cut in civilian nickel, perhaps as early as February," says an industry man close to current government thinking. "Stockpile targets are not quite digestible at the present time," comments another. Reportedly under consideration by Office of Defense Mobilization is an adjustment of immediate stockpile sights in the interest of industry, though no meeting has yet been scheduled on the subject.

Controls or No Controls — The threatened supply choke comes at a time industry is beginning to breathe easier about nickel. Decontrol has had little to do with it: No more metal was available after Nov. 1, when allocation and end-use curbs terminated, than before. At that time government allocation in effect gave way to private rationing.

Still, a notable easing came in November and December. One contributing factor is a tapering of defense needs in general. They have leveled off in the last two months to a consistent pattern without special projects to siphon off large tonnages unexpectedly. Defense take today, outside of stockpile, is less than 40 per cent of supply.

Effect of a Decline — Secondly, several industries consuming the bulk of nickel output experienced a decided business slump about the time controls were dropped. Heading the list are stainless steel, nonferrous alloys and electrical resistance alloys. Users are either whittling inventories or trimming operations. Stainless foundries report no severe drop-off in orders, though backlog is now down to "reasonable proportions." New business is off in heat-resistant alloy castings, particularly those for industrial furnaces. Electroplaters are an exception: Most of them still can't get enough nickel to come close to pre-Korea operations.

A first-quarter business upturn is expected by most of these industries. If it develops, chances are good the nickel shortage will reappear stongly; additional stockpile drain would worsen it.

Unexpected—Steel men expected a surge for nickel-bearing stainless in November. It never developed.

Before the Korean war, indus-

try used about two-thirds chrome nickel and one-third straight chrome, says Allegheny Ludlum Steel Corp.'s R. A. Lincoln. The two reversed positions since, and now are in process of swinging back to the former pattern, but more slowly than expected.

Heavy Buying — Even though sales are flat, stainless companies are said to be buying as much nickel as they can get. Reasoning is that should nickel again become scarce they would be on record as large buyers. An offshoot of this is that steel mills aren't taking much nickel-bearing scrap and Bureau of Foreign Commerce has open-ended exports for the first quarter. This move will undoubtedly stimulate more conversion deals.

European sellers currently are asking $1.50-$1.75 a pound for pure nickel scrap. "Unlimited amounts" of pure nickel can reportedly be bought in this country.

No Hardship — Makers of electrical alloys, which use high percentages of nickel, are getting all they need at the moment, but demand is off, according to E. A. Harleman, purchasing agent, Driver-Harris Co., Harrison, N. J.

The situation is much the same in nickel silver. "We're probably getting 80 per cent of our needs, though it varies from month to month," says A. G. Wentworth, executive vice president, Seymour Mfg. Co., Seymour Conn. "Customers aren't buying for inventory because of a nearly universal belief that the price of copper, a major ingredient of nickel silver, is about to head lower."

Comeback — Silverplaters found low-nickel alloys unsatisfactory because of off-color finish, and most shops went into straight-chrome stainless. The 18 per cent nickel grade is normally most used; under controls sellers concentrated on 10 per cent alloy.

With the 18 per cent nickel base metal for plating now available, plated flatware and tableware are due for a comeback. Where stainless is used, flatware producers are already moving back to 18-8, retaining 430 in lower-priced lines.

Autos Fare Better—Automakers say they're still getting more promises than nickel at the moment, though supplies are improving generally and 40 to 100 per cent of needs are being met. Motordom cut down sharply on nickel alloy usage during the shortage.

Beefed-up plating standards of pre-Korea days are sought by auto companies. Interior parts will be 0.0003-in., bumpers and scuff parts 0.001-in., die castings 0.0003-0.0005-in.

Still Suffering—Hardest hit of any nickel users are the nation's 3000 job platers. Before decontrol they were getting about 30 per cent of 1949-50 usage. December rations were about 45 per cent of this quota on the average, says R. M. Shock, National Association of Metal Finishers, Washington. Platers are setting about undoing the wrongs of the copper buff plate and nickel "kiss" allowed under controls that have given plating a black eye. They need more nickel for it though. Typical comment comes from Leonard Elker, Advance Plating Co., Cleveland: "We could use more—about 100 per cent more—than we get."

Platers had a busy Christmas season. November sales of MacDermid Inc., Waterbury, Conn., were highest in company history, reports Harold Leever, executive vice president. MacDermid's chemicals are consumed on the job and not put into inventory, so are a good indicator of operations.

Speaking Privately—Preference for private allocation is expressed this way by a job plater: "Now we can ask for what we want instead of what we're entitled to under government regulations."

Expansion Talk—Nickel expansion has been talked in Washington since defense agencies came into being. Purchase agreements negotiated with private producers to date cover more than a quarter-million tons of nickel over the next ten years. ODM's announced expansion goal for nickel—190,000 tons yearly capacity by 1956—is still only 80 per cent completed. GSA has 57,500 tons under contract and 95,000 tons is not assisted, leaving the program 38,000 tons short. Negotiations are now under way to narrow this deficit, with Cuba a focal point of attention.

A number of new projects are coming into operation, but it does not mean more nickel for industry, as most will go directly into stockpile. The 1954 operating level of most industries dependent on nickel will hinge primarily on two familiar factors: Nickel availability and stockpiling activities.

United Press

Lack of Sight No Handicap Here

Turning a handicap into an advantage, Barney Duncan, a sightless worker in the Griffin, Ga., plant of Georgia's Factories for the Blind, checks tiny aircraft parts used in the assembly of B-47 Stratojets in the Lockheed Aircraft plant at Marietta, Ga. The remarkable sense of touch of the blind workers enables them to sort the match-stem-size parts with almost infallible accuracy at top speed. The factory processes about 7500 pounds monthly of 9000 different parts

RCA

RETMA Reports Record Output Year

Radio - Electronics - Television Manufacturers Association chairman predicts high-level defense production in 1954. Civilian production will be influenced by impact of color TV

RADIO, ELECTRONICS, television industry marked up its best year in 1953 even though no single component of the industry set any sales records, said Robert C. Sprague, chairman of Radio-Electronics - Television Manufacturers Association.

Mr. Sprague estimated total 1953 production of about 7,250,000 TV receivers and more than 13 million radios, including about 5 million automobile sets. This is better than 1952 figures by a million television sets and 2 million radios but short of the record year of 1950 for both products (see STEEL, Dec. 21, p. 40). However, the RETMA chairman said that incomplete figures indicate dollar value of TV set sales this year will top the similar figure for 1950.

More Signals, More Receivers—One of the big reasons for the good year in civilian products was the rapid rate at which Federal Communications Commission issued construction permits for new television stations following the 3½-year freeze.

Another important factor in the high level of business was the TV replacement parts market. It amounted to nearly $500 million this year. In addition, radio and phonograph sales, "which many persons erroneously thought at an end when television made its debut," made a strong comeback this year, due partly to the rising interest in high fidelity reproduction of sound (see STEEL, Dec. 14, p. 87). Latest complete figures for 1953 show that in the first ten months of 1953 television sets outsold radios, excluding auto sets, by only 4,922,128 to 4,911,415. Both were above the same 1952 period.

Still the Big Gun—"Despite the outstanding production record of the industry in the radio-TV field, the greatest dollar volume of business was done, as in 1952, for the military," Mr. Sprague reported. Best estimates range between $2.7-billion and $3 billion worth of electronic and communication products produced for the government this year.

The outlook for 1954 is colored by what happens in the field of color television and the course of defense spending, Mr. Sprague said. (For more on color TV, see following story.) However, he predicted the industry would sell 6 million television sets and 10 million or more radios in 1954, a good year by any standards.

Not Worried—Defense production does not pose such a complicated problem as the industry looks forward to another high-volume defense production year, regardless of what happens to the military budget.

Color TV in 1954?

Yes, but in limited numbers only. It'll be expensive, too. Here's the outlook

PROMPT approval of technical standards for color TV by the Federal Communications Commission puts the spotlight on the possibility of getting commercial color TV in 1954.

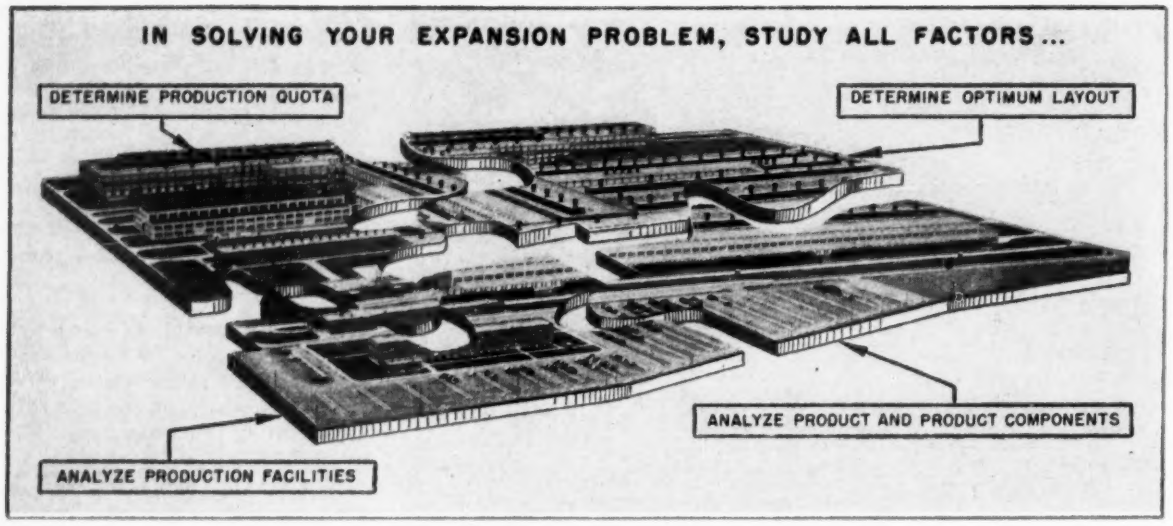
Despite the ballyhoo, chances are there will be few color receivers on the market next year and the price tags on the few which will be available may well run into four figures.

Informed Opinion—J. B. Elliott, vice president in charge of consumer products of RCA's Victor Division, says: "After FCC approves standards for compatible color telecasting, experience tells us that it will take upwards of six months before the first small quantities of color receivers will be available from production . . . As a new product, the initial color receivers will be costly, perhaps between $800 and $1000."

From Scratch—Prime reason behind the delay in commercial color TV is that the industry must start from the beginning to prepare for the new medium.

In the first place, there'll be production facilities to build—manufacturers estimate that by 1955 output of color tubes will reach only 1.5 million. These first tubes will have a 12 to 14-inch viewing area. Then, there are broadcasting and servicing facilities to build and manpower to train.

For example, Westinghouse scored what it believes to be a first in the TV industry with its two-week color television service school for field service engineers this month. Though it's a start, that still leaves a long way to go in training personnel. Color television will probably hit its stride in 1956 when technical developments, such as tape recording, will be ready on a commercial scale to help boom the media.


IN SOLVING YOUR EXPANSION PROBLEM, STUDY ALL FACTORS...
DETERMINE PRODUCTION QUOTA
DETERMINE OPTIMUM LAYOUT
ANALYZE PRODUCT AND PRODUCT COMPONENTS
ANALYZE PRODUCTION FACILITIES

Expansion, Modernization: Muscle for Competitive Strength

PLANT modernization and expansion could be the key for bettering your position as the competition gets tighter.

Most company executives are at some time or another in their firm's development faced with the question: Will modernization and expansion help produce at a cost lower than that of the competition? Estimates by executives (see STEEL, Dec. 21, p. 37-38) show that many are already gearing for the growing competitive challenge and will spend nearly $26 billion next year on new plant and equipment.

Pitfalls, Too—But modernization and expansion per se are not the complete answer. Walter Kidde Construction Inc., engineering and building firm, New York and Houston, points out that modernization and expansion must be done on an organized basis with all factors receiving careful analysis. Penalties for hastily taken action are many—duplication, lack of co-ordination between old and new facilities, overlooked opportunities for savings in time, labor and equipment.

Four major factors which Walter Kidde emphasizes in determining whether to modernize and expand are listed above.

Past and Future—In determining production quotas, management should look at past sales records and try to determine where orders have been lost because of slow deliveries, inadequate capacity or other internal operations. Market research studies should be made to forecast the long-range outlook for product sales. Product unit costs should be evaluated, along with the profit or loss and overhead carried by each. By calling in the engineering department, evaluations can be obtained showing the extent to which profits can be increased and costs reduced by new products or manufacturing techniques.

In analyzing products and their components it's important to evaluate savings which would be possible by manufacturing parts currently being purchased or purchasing parts currently being made. These problems are basic to final determination of capacity for a plant.

Engineering — Analysis of production facilities will determine the basic tools, equipment and machinery necessary in the project. These studies should include operational flow; equipment which can combine two or more operations to save labor; possible time and material waste-saving operations and equipment; salvage or reuse of old equipment in a new line.

Final step in the process is to determine the optimum layout for the facilities. Problems of storage, operational sequence, handling and servicing must be resolved to establish the basic square footage of space required.

The Picture—Carried out efficiently, the above four steps should provide management with data indicating the basic cost of the program and the additional profit to be expected from expanded facilities. These should present an accurate picture of whether the proposed modernization and expansion program is economically justified.

The outlook for 1954 as a year to expand is bright, according to construction officials. Most are predicting that construction costs will be lower because of sharper competition and greater availability of materials. Companies which cannot expand present plants to achieve maximum efficiency will find it to their advantage many times to relocate.

Outside Aid—One further suggestion by Walter Kidde—management should consider the advisability of enlisting the aid of an engineering organization in making such a study. A competent firm can bring a fresh, objective outside viewpoint to the task. Not only will these men not be burdened with day-to-day operating problems, but they can also contribute the best engineering practices of your industry and of others when they apply to your problem.

AISI Adopts Output Index

American Iron & Steel Institute's newly adopted index of the steel industry's ingot production by using a 1947-1949 base period—average annual production of 83,837,572 net tons during those three years was greater than the output of all prior years except 1942, 1943 and 1944—is on the same basis as several recently revised government indexes.

The new index will be issued in conjunction with the release of the usual weekly operating rate starting Dec. 28. It will supplement the operating rate by showing that as much steel could have been made at 89.5 per cent of capacity in 1953 as at 100 per cent of capacity in 1951.

During the week beginning Dec. 14 and ending Dec. 20, the index measured 118.2 per cent of the 1947-1949 average.

Ferro Corp.: "More in '54"

New and expanded markets will lead Ferro Corp., Cleveland, to a larger sales volume in 1954, predicts Robert A. Weaver, Ferro board chairman. Sales for 1953 are estimated at $38 million.

New markets are expected for Ferro's Porcelain Enamel Frit & Glaze Division in frit products. Sales to the plastic industry in the color and chemical divisions are also expected to increase in 1954 if general business conditions do not vary substantially from the present.

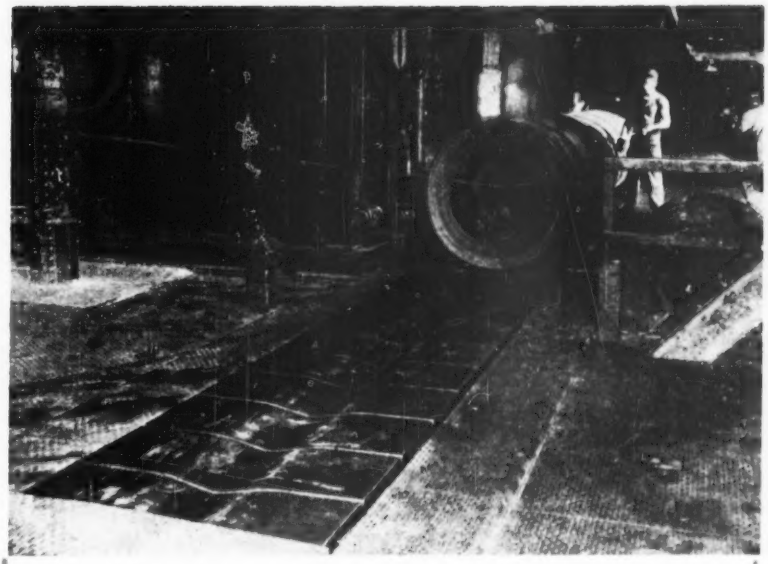
Ferro Powdered Metals Inc., a wholly owned Ferro subsidiary formed this year, showed losses in 1953, the chairman disclosed. However, new company personnel and equipment and strong growth potentialities in the powdered metals industry are expected to place the firm on a profit-making basis before the end of 1954.

Norge Predicts Sales Hike

Norge Division of Borg-Warner Corp. will contribute about $50-million to expected corporation sales of $400 million in 1953, says George P. F. Smith, Norge president.

Mr. Smith predicts Norge sales in 1954 will be above those in 1953, which in turn have run 10 per cent above 1952. Part of the increase will come through product diversification: Norge has added a new gas water heater to its line of home appliances as a companion to its electric water heater.

Currently Norge is down to around 50 per cent of capacity production.



Cost-cutting with automatic handling puts . . .

Lift in Materials Handling Sales

THE MATERIALS HANDLING industry lifts its sales higher as steadily as materials handling equipment lifts the loads of American business.

Figures released by the Bureau of the Census on the 1952 Survey of Manufactures shows dollar shipments of all types of materials handing equipment increased 67 per cent from $735,234,000 in 1947 to $1,230,816,000 in 1952. During that period, dollar shipments of moving stairways and elevators increased 20 per cent from $96,421,000 to $116,545,000; shipments of overhead cranes and monorails jumped 239 per cent from $37,242,000 to $126,274,000; industrial trucks and tractors increased 106 per cent from $156,754,000 to $322,166,000; shipments of power cranes, shovels and draglines rose 64 per cent from $247,985,000 to $385,094,000; and shipments of conveyors and conveying equipment increased 43 per cent from $196,832,000 to $280,737,000.

The Low Side—R. C. Sollenberger, executive vice president of the Conveyor Equipment Manufacturers Association, says his guess is that the conveyor figure is low as it does not include conveying equipment which forms a component part of some processing machine, nor does it include replacement belting sales and belts sold directly to the user by the rubber manufacturer.

Over the six years from 1947 through 1952, manufacturers' inventories for the materials handling industry almost doubled from $50,181,000 to $98,194,000. Average employment grew from 24,578 to 34,355.

Still Gaining—Industry estimates forecast a $1.5-billion volume this year, about a 20 per cent increase in 1953 sales over those of 1952. (See STEEL, Dec. 21, p. 39.) Some see a $2-billion business in 1954. (A new index for materials handling sales is on p. 47.)

BDSA Seeks Advice; Plans Flexible Industry Advisers

Business press, trade associations to be included in less formal organizations

FLEXIBILITY will be the keynote in the system of industry conferences set up within the Business & Defense Services Administration to provide means for advising the secretary of commerce and other department officials on broad-gage policies and programs to benefit business, government and general economy.

The new setup will give the business press and trade associations more recognition than ever before in government councils. Lothair Teetor, assistant secretary of commerce for domestic affairs, said that representatives from these two groups as well as individual businessmen will be called in by BDSA for consultation on special problems of industry as occasions arise. Memberships in the conference will have no fixed terms. Each conference will handle the problem for which it is assembled and then adjourn.

Changed Minds—The original plan to set up more or less permanent industry councils was abandoned because of the rigid character of such organizations. Under the new plan, the nature of the problem involved will in large part determine who is to be called upon to solve it.

Several industry conferences have already been set up, namely for the distribution, pulp and paper, electrical manufacturing and construction industries. Others are being organized as rapidly as possible.

Physician, Heal Thyself—Mr. Teetor said it will be the aim of these conferences and BDSA to do those things that the government can do for industry, but not things that industry can do for itself.

Meanwhile, BDSA has completed its organization of 25 industry divisions and 4 service offices. The main officers of the administration and the metalworking industry divisions are at right. BDSA has moved from new GAO building to main Commerce department building.

BDSA DIRECTORY

Office of the Administrator	Main Building, Commerce Department	
	Extension	Room No.
Charles F. Honeywell, administrator	4913	4848
Edward C. Gaertner, assistant to the administrator	3047	4833
Horace M. McCoy, deputy administrator	8112	4838
William E. Haines, assistant deputy administrator	4604	4834
Harry L. Smith Jr., assistant administrator	8025	4858
Perrin G. March, assistant administrator	4901	4852
Walter A. Edwards, assistant administrator	4901	4852
Paul H. Jordan, public information officer	4805	4845
Industry Divisions		
Agricultural, Construction & Mining Equipment Division Deputy director: John Skillman	4317	4111
Aluminum & Magnesium Division Acting director: Everett G. Fahlman	4437	4807
Automotive Division Director: George R. Davis	3294	4100
Building Materials & Construction Division Deputy director: Charles Pedick	8227	4039
Business Machines & Office Equipment Division Deputy director: James L. Oliver	3518	4001-A
Communications Equipment Division Director: W. Elmer Pothen	4821	4033
Consumer Durable Goods Division Deputy director: Charles Hughitt	8051	4325
Containers & Packaging Division Director: Charles A. Lewis	8061	4045
Copper Division Director: Marvin A. Joy	4074	4806
Electrical Equipment Division Deputy director: Carney G. Laslie	2175	4114
Electronics Division Acting director: Donald S. Parris	4036	4117
General Components Division Director: Clarence R. Burrell	3155	4126
General Industrial Equipment Division Deputy director: Harry S. Mills	4327	4005
Iron & Steel Division Director: Kenneth J. Burns	4412	4812
Metalworking Equipment Division Acting director: James M. Lawson	593	4015-A
Miscellaneous Metals & Minerals Division Deputy director: Harry B. Sharpe	4551	4827
Power Equipment Division Director: Dudley Selden	4241	4120
Scientific, Motion Picture & Photographic Products Division Director: Nathan D. Golden	8102	4317
Water & Sewerage Industries & Utilities Division Director: Thomas T. Quigley	8125	4069
Shipbuilding, Railroad, Ordnance & Aircraft Division Acting deputy director: Francis H. Winget	637	4023

U.S. Finishing Machine Tool Policy

The aim is to spare builders the grief they had after World War II when federal dumping of war-bought equipment had the industry staggering

THE GOVERNMENT is grinding the finishing work for its machine tool policy.

The aim: A policy so well engineered that builders will be spared the grief they had after World War II when some manufacturers were nearly forced to bankruptcy because the U. S. dumped so many of its war-purchased tools on the market at bargain-basement prices.

Who's Eligible—Now, in setting up a new Defense Mobilization Production Equipment Inventory, DMPEI, the Business & Defense Services Administration's Metalworking Division has set up strict criteria under which machine tools and other equipment in this inventory may be leased to private industry.

The DMPEI inventory, now being made up, includes idle machine tools and production equipment owned by the Atomic Energy Commission, Maritime Administration, Department of Health, Education & Welfare, and General Services Administration. It is not connected with the huge inventory of government-owned machine tools and equipment controlled by the Defense department's Production Equipment Redistribution Group. Leasing of the several thousand DMPEI tools will, of course, be to an entirely different set of users than those entitled to get tools from the PERG. PERG tools may be leased only to military contractors, usually those with contracts for producing military end-items.

Criteria—Under the BDSA criteria, incidentally, DMPEI tools will be leased to defense-support activities only when the equipment is not currently available elsewhere, only when the equipment is needed to meet current production schedules and only where the tools will be used on defense-supporting activities. When any or all of these criteria no longer pertain, the lease is subject to termination.

The Defense department will prohibit the use of its tools for nondefense except in emergencies.

Definition—The directive defines nondefense production as "all production which does not result in military end-items, or components intended to be physically incorporated into such end-items. In cases where production equipment is to be used to produce both defense and nondefense items, production will be considered nondefense when less than 75 per cent of the output is for military end-items or components."

Another Problem—The import-export situation poses another equipment industry problem and is being studied by BDSA's Metalworking Equipment Division.

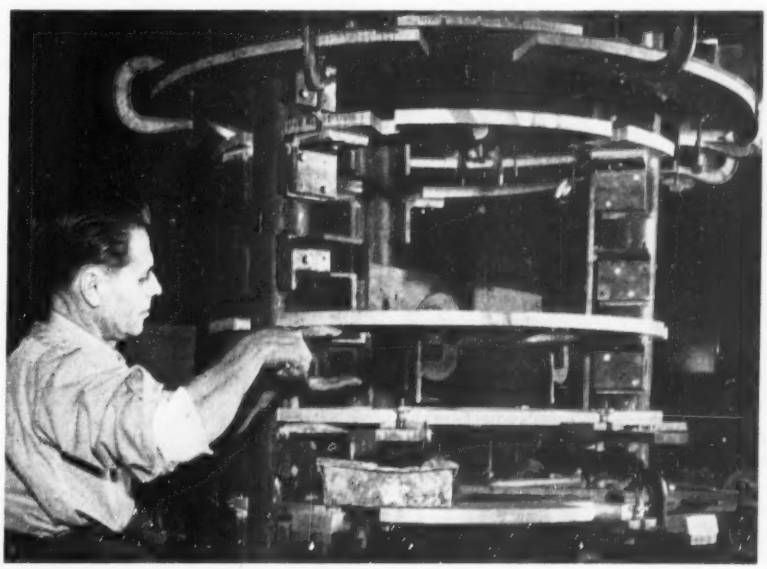
As a starter, some curves have been compiled. The export curve shows that in January, 1951, our machine tool exports averaged $5-million a month. This moved up to a high of $13 million a month in March, 1953. Since then there has been a precipitate drop to less than $6 million in August, with the curve still headed violently down.

Missing the Mark—Thus, machine tool exports have been nowhere near the historic average of about 20 per cent of the domestic output. In August, 1953, they were running 7 to 8 per cent. At this peak in late 1952 and the first quarter of 1953 they averaged 12 to 13 per cent.

As to imports of machine tools, the figure for January, 1951, was $250,000. This moved to a peak of $3 million a month and stabilized in August, 1953, at a $2.25-million level.

Pool Success—The great pool order program of the government will be virtually closed out by Dec. 31, 1953.

Incidentally, a few types of tools still are in very short supply for defense production needs. These are jig borers, jig millers and jig grinders; lead time for these extends 10 to 12 months ahead. There is also some shortage of No. 4 and larger milling machines; some makers still have lead time of 10 to 12 months. Otherwise, the supply of tools has caught up with current needs.



Toolmakers Reach for Dental Plastic

Convair toolmakers are using dental plastic to fill cavities around assembly-fixture locater pads to help maintain preset dimensions. This method, suggested by two Convair employees, saves the San Diego division of Consolidated Vultee Aircraft Corp. approximately $43,000 a year. The dental plastic is a flour-like substance which becomes dough-like when mixed with water. It is easy to mix, to shape by hand as shown above and to apply. Tests prove it takes 11,500 pounds pressure to crack dental plastic. Expansion in drying is small

By E. C. KREUTZBERG *Washington Editor*

Eisenhower Lays the Groundwork; More Success in 1954 Is Likely

SPIRITS OF EISENHOWER partisans have taken a turn upwards following the slump which set in with the Democratic victories in Wisconsin, New York and New Jersey and the narrow-squeak win of a Republican in California.

Optimistic — A leading Republican in the House told STEEL: "It is better to get unfavorable public reactions in the first year; that puts the finger on what is wrong and helps shape up policies the majority will support. I don't think what happened to Truman toward the close of his administration is going to happen to Eisenhower."

Reason for the enhanced Republican confidence is the fact that this administration's programs, in contrast with the lame performance in 1953, are to be presented in positive, detailed form in 1954. Another reason is that the three-day White House conference in which Republican congressional leaders and committee chairmen were consulted on the coming presidential messages has dissipated the every-man-for-himself philosophy.

Home To Roost? . . .

Washington has been fairly crawling with study groups, most of which will report in time for 1954 legislation. The Hoover commission has been studying further reorganization of the government, the Randall commission foreign economic policy, the Eric Johnston group the future of the technical co-operation program, the Cole committee national housing policy, the McKay committee mineral policy, a Treasury advisory group tax reforms, the Prettyman conference committee improved administrative procedure, a Benson advisory group farm price support policy. Studies of other problems, notably the national defense and foreign aid programs have been directed by the President in person, while still others, as Taft-Hartley amendments, atomic energy amendments, social security expansion and improvement in the unemployment insurance system, have been conducted by or directed by the White House staff.

In addition, all government departments and agencies and their bureaus and sections have been subjected to challenging surveys—like the one Robert Heller Associates are conducting at the Federal Trade Commission — to reduce paper work, eliminate waste and introduce more efficient procedure.

Never before have the government and national policies been analyzed in such thoroughgoing fashion, with contributions from so many competent individuals. In 1954 all this preparatory work is due to jell, so it is a foregone conclusion that Eisenhower is going to look much better to the public a few months hence than now.

Interior Troubles . . .

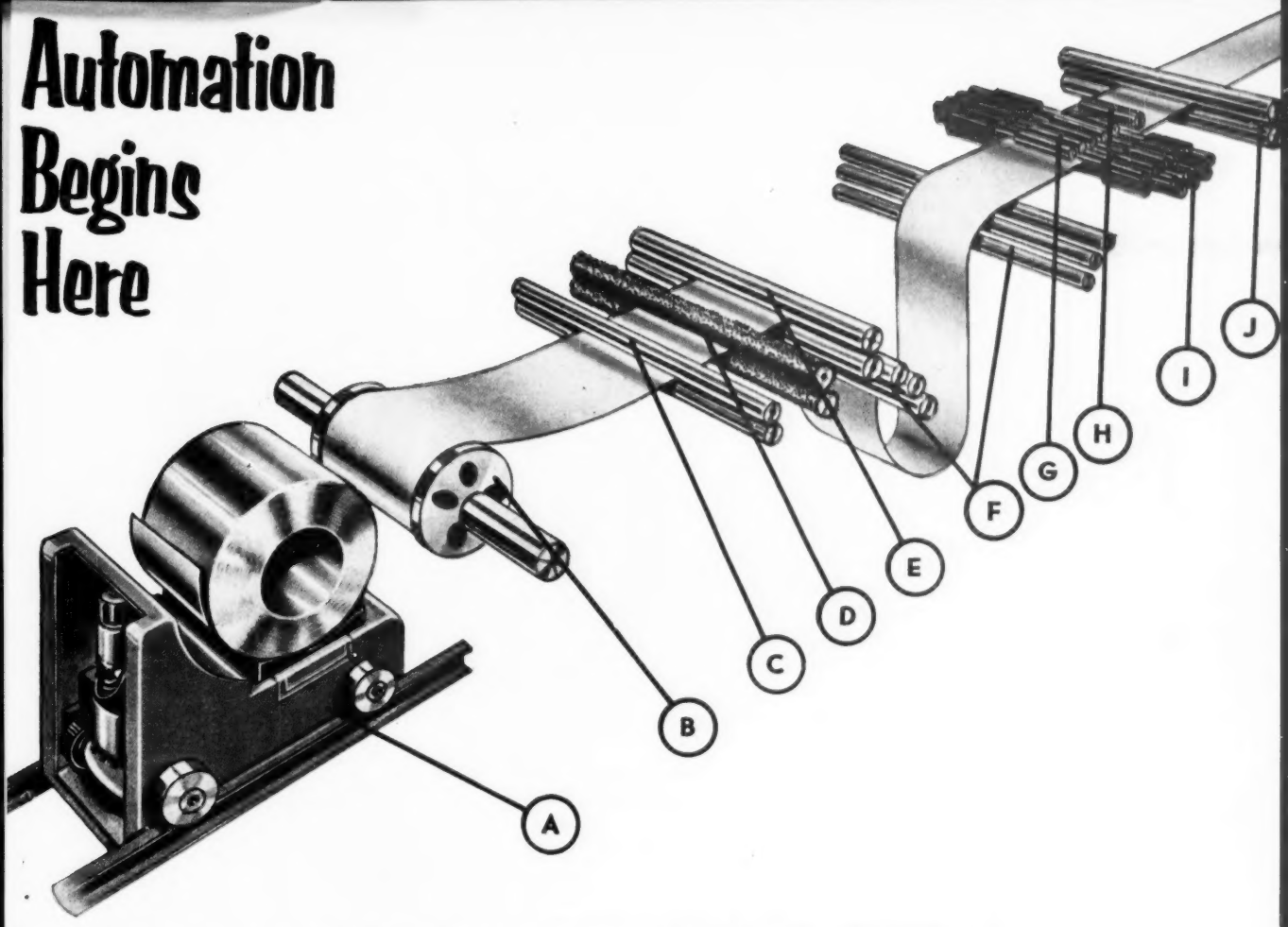
The administration has encountered difficulties in certain departments, notably Interior, due to high-level Truman holdovers unsympathetic to the Eisenhower policy of relying on private enterprise to take over from the government the initiative in certain lines of expansion, particularly power generation. The main trouble has been that there was no easy way to get these people out of their jobs without threatening the career system.

From now on this problem should be eased as a result of a decision by Federal Judge Richmond B. Keech dismissing the action of a Department of Justice employee who held that under the civil service statutes he could not be fired from his job. The judge ruled, in effect, that there is no limit to President Eisenhower's authority to fire government employees. On the basis of this decision the President is readying a new executive order to insure that undesirable employees be fired but with least possible upsetting of the civil service classification system.

United Press

CONGRESSIONAL LEADERS CONFER AT THE WHITE HOUSE
. . . the President seeks stronger support next year

Automation Begins Here



Automation—the automatic handling of work in process — permits manufacturers to combat high labor and material costs by boosting man-hour production. McKay has played a large part in this movement by designing and building "automated" equipment for the automotive and steel fabricating industries.

For example, coil feed lines of the type illustrated above were designed and built by McKay for several leading automotive firms. They are used to automatically feed coil stock into square shears or blanking presses, thus eliminating inefficient and laborious methods of manually feeding these machines.

TYPICAL LINE EQUIPMENT

(A) Hydraulic Loading Car for stand-by coil.

(B) Cone Type Coil Holder handles wide range of coil I.D.'s and O.D.'s.

(C) Guide Rolls to direct strip into brush rolls.

(D) Brush Rolls with solvent sprays to clean strip.

(E) Driven Pinch Rolls for pulling coil stock and filling storage loop.

(F) Guide Rolls to support loop.

(G, I, J & H) Feeder unit consisting of Backed-Up Leveler **(G-I)** and pinch rolls **(J)** is powered by D.C. drive which is controlled by a measuring device driven from measuring rolls **(H)**. The feeder flattens the strip and accurately measures it into open press dies or through shear knives.

Line operation is synchronized with the press or shear for maximum production. McKay builds these units with design, speed, and capacity dictated by your job requirements.

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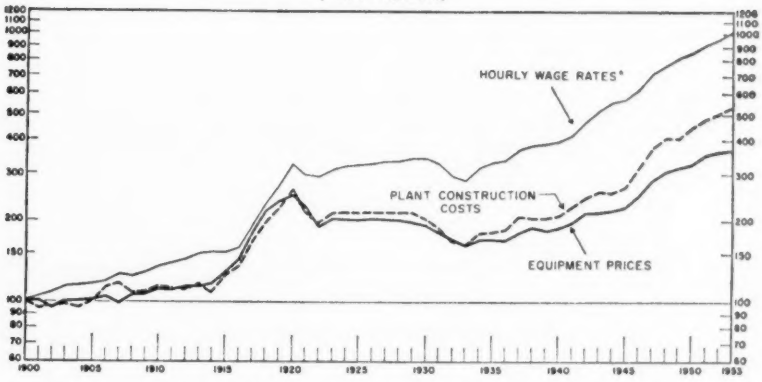
IN CANADA - The WALLACE BARNES CO., Ltd., Hamilton, Ontario

DIVISIONS OF ASSOCIATED SPRING CORPORATION

Equipment Prices, Plant Construction Costs, Hourly Wage Rates for American Business

(Index: 1900=100)



*Average hourly earnings of all hourly-rated workers. Since 1929, these rates include an allowance for employer payments for social security and for private pension and insurance plans.
Source: Machinery & Allied Products Institute.

Equipment Still Best Buy—MAPI

Survey from 1900 to 1953 shows wages, new plant costs and equipment prices all have risen. But in relation to its two alternatives, new equipment is still cheapest

PRODUCTION EQUIPMENT, in terms of price comparisons with wage rates and plant building costs, is today a "good buy" and probably will continue to be for some time if trends of the past few years continue, reports Machinery & Allied Products Institute.

In a study of comparative trends from 1900 to 1953, MAPI has determined that while the index of hourly wage rates has risen a little over 1000 per cent, cost of plant construction has risen 540 per cent and equipment prices only 370 per cent (all based on 1900 equal to 100, see chart above).

Advantage for Equipment—This means that although all three have risen in the period studied, wages and cost of new plant have risen at a much faster rate than equipment, leaving the latter in a position of relative cheapness. This is especially important, MAPI says, in view of the fact that equipment and labor are in some measure competitive. "When capital goods are relatively expensive, the 'mix' tends to be shifted in favor of labor; when they are relatively cheap, the tendency runs the other way."

MAPI points out that new plant and equipment also are interchangeable. "With plant abnormally expensive in relation to equipment, industry naturally tends to favor the latter, and has done so." This partially accounts for the fact that even though postwar plant construction on the surface seems at a high level, it is actually low in relation to equipment purchases and the projections of its own historic growth trend.

More Evidence—The divergence of the trends is readily apparent from the above chart, which is plotted on a logarithmic verticle scale. However, a comparison of ratios obtained by dividing the two price indexes by the wage index shows the difference even more. On that basis, equipment prices are currently only 37 per cent as high relative to labor as they were in 1900. New plant construction is 54 per cent as high relative to labor. From 1900 to 1940, the progressive divergence of these two ratios followed a fairly normal pattern, sticking close to the projected trend with only a few extraordinary periods up to the end of World War I.

Since 1940, however, the equipment-wage ratio has been lower than the projected trend indicated it would be, and the new plant-wage ratio has risen above the projection. If the latter had continued its pre-1940 ways, it would now stand at around 41 per cent of wages rather than the 54 per cent indicated above. This has further increased the "mix" toward relatively cheaper capital equipment.

Grain of Salt—MAPI hastens to point out that the statistics involved are not wholly adequate, but the trend is still unmistakable. The wage figures used since 1940 do not include the paid holidays and paid vacations won by workers since then. If those values could be worked into the denominator of the ratio computation, the recent price-wage ratio would be even lower than indicated.

The institute also points out that it should not necessarily be inferred from this study that the divergence is entirely due to the increased purchasing power of higher wages. "We should infer rather that the productivity of an hour's labor" has risen faster than ever before. "For it is rising productivity . . . that makes possible the progressive divergence of money wage rates from prices and with it the increase in the purchasing power of labor."

Good Future—MAPI concludes that if equipment can "remain cheap hereafter in relation to labor and to plant, as it has since (World War II), it should continue to enjoy the competitive strength associated with this advantage."

Michigan Woos 'Copter Industry

Michigan Economic Development Commission named a special aircraft manufacturing advisory committee to investigate the possibilities of mass production of helicopters in that state.

Declaring that the industry is just now emerging from its experimental stage, Peter Altman, consulting engineer for Continental Motors Corp., Muskegon, Mich., and chairman of the committee, believes "helicopter production is a natural for Michigan." In 1952, the industry sales reached about $150 million, and it started this year with an estimated backlog of orders well over $400 million.

Shake-Up In World Trade Coming

War-induced shortages of steel disappeared in 1953. That means new world trade patterns, held back by emergency conditions, are now free to form. Competition will be intense

HOLD onto your chapeaux, as the French might say. In 1954, more than in any year since World War II, new patterns of world trade will be formed.

Reasons why are not hard to find. The Korean-born world shortages of raw materials and steel are gone. World output of steel will be about 256 million tons in 1953, up some 11 per cent from 1952's 231,304,149 tons and a new all-time high. While U. S. output will be up nearly 20 million tons, British output up more than a million tons and Japanese output up too, major Western European steel producing countries (France, Belguim, Luxemburg, West Germany, Italy and Sweden) will produce nearly 3 million tons less steel in 1953 than in 1952. And that is with increased production capacity available.

No Rocking Chair—It's a sure bet European steelmakers are not going to sit quietly while their relative share of world steel production shrinks. Indeed, they cannot.

Reconstruction of European metalworking is for the most part a *fait accompli* — industrial production is estimated to have risen to levels one-third or more above their 1938 positions. Every country in Europe is faced with the necessity of exporting a substantial portion of its wares in order to maintain economic solvency. So the 5 to 10 per cent drop in business expected in 1953, like the dip in steel output, has Europeans talking of more intensive export drives in 1954.

Pattern Makers—Other factors likely to make 1954 much more of a pattern-setting year than 1953 include the following: U. S. aid programs are stabilizing and slated to begin tapering off in the near future. Not wanting to be caught riding a dead horse, Europeans are anxious to capture new markets to replace U. S. money aid.

A National Industrial Conference Board study reveals that of 124 different quotations for heavy electrical equipment to Latin American and Asian countries in the past 18 months, European firms underbid American firms in 80 per cent of the cases. European manufacturers, on the other hand, complain that Japanese competition is cutting into Latin American markets formerly looked upon as the Europeans' particular hunting grounds.

Reversals—Other world markets in the Near East, Far East and South Africa—where large public works or other developments are under way—are also taking full advantage of the present buyers' market conditions. Moreover, many countries are forming or expanding their own steel and metalworking industries, causing some shifts in sources of supply as demand shifts from consumer goods to capital goods. These conditions all have the tendency to upset traditional trade patterns, open the way for new ones.

Finally, the split between the Eastern world and Western world may be showing no signs of healing, but Europeans are encouraged by growing competition to begin trying to live with the cleavage. That means buying and selling whatever they can, short of guns and bullets of course, through the ferrous drapery.

May Be a Clue—One purely European development being watched by metalworking men from South Wales to South Chicago to Tokyo for a clue to new world trade patterns is the European Coal & Steel Community. Strictly speaking, the metalworking industries of the member nations have not yet been directly affected by ECSC activity. Steelmakers have, however. They have made significant monetary contributions to the organization but find tangible advantages of the scheme more difficult to point to.

It's true that raw material and steel prices have dropped in Europe. But that's not due so much to ECSC activity as to current economic conditions. Actually, price fixing machinery of ECSC is so complicated, particularly in regard to extras and parity points, that official ECSC prices often lag behind the facts. Some member nations, notably West Germany and Belgium, charge that confusion among steel buyers over ECSC country prices lost them sizable orders during 1953. To back up that charge, West German steelmakers point out that steel output of ECSC nations dropped some 2½ million tons in 1953 at the same time British steel output was increasing. Late reports from Germany quote joists and merchant bars available for export

to any dollar country for $80 per metric ton, f.o.b., a price 10 to 20 per cent below official ECSC price.

Changing Talk—As 1953 draws to a close, talk at ECSC meetings turns from the subject of expansion of steelmaking capacity to maintenance and promotion of export markets. Though ostensibly still very much against cartelism, the ECSC has yet to prove it will not become a giant supernational cartel itself in the growing competitive conditions of 1954. Another possibility — it could fall apart over the pricing issue.

Not the least important factor in the new trade patterns which will form in 1954 is the position of the U. S.

Prime Target—Europeans have, since World War II, been growing more interested in the U. S. as an export market and nearly all of them have special export programs pointed at the American market. The National Industrial Conference Board study prepared for the National Electrical Manufacturers Association shows foreign countries have been quite successful in cracking the U. S. market in electrical equipment fields at least.

While total sales of electrical equipment by U. S. manufacturers were nine times their prewar average in 1952, imports into the U. S. were 12 times their prewar average and export sales by American firms were only six times higher than their prewar level. In the first half of 1953 as compared with the first half of 1952, U. S. imports of electrical equipment rose 50 per cent while U. S. exports of electrical equipment rose only 9 per cent.

A Gap Gone—The Conference Board study goes on to say this about the U. S. foreign trade position in general: "If the 'dollar gap' be defined as the excess of the dollar value of U. S. exports of goods and services over U. S. imports of goods and services, then the gap has vanished, at least for the time being. During the year ended June 30, 1953, U. S. imports for the first time since prewar days substantially exceeded U. S. exports for which we were paid." That is excluding foreign economic and military aid shipments.

While striving to sell the American market more goods, most European countries still maintain their economic positions are too unstable to permit unlimited dollar imports. "The rise of foreign dollar and gold holdings to an all-time high with the upward trend unchecked has not resulted in an expansion of American commercial exports, as expected," says Dr. Claudius T. Murchison, economic adviser to the American Cotton Manufacturers Institute. "On the contrary, the soft currency countries still pursue policies of trade discrimination against the U. S."

FOA

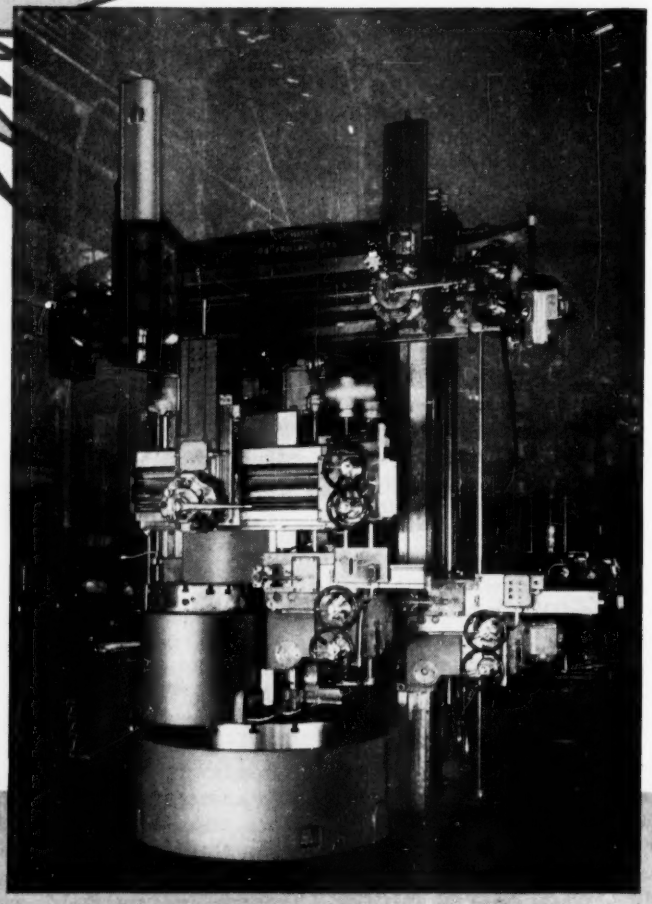
EUROPEAN STEELWORKER IN 1953
. . . his output was less but the boss has plans to boost sales

Coming Next Year—Revised position of the U. S. in the post-Korea trading world will not be known until after the 17-man Commission on Foreign Economic Policy, chairmanned by Clarence B. Randall of Inland Steel Co., makes its report in January and the report is acted upon. Europeans hope American tariffs will not be increased in the near future and that any U. S. action will help stabilize the trade patterns being formed. The American Iron & Steel Institute, conversely, warned the Randall commission, "Regardless of the efficiency that the American steel industry has demonstrated over the past 50 years, in spite of its great vitality and tremendous adaptability through two wars and monumental changes in our social structure, it cannot meet artificial competition involving unfair trade practices . . . Unfair methods of competition from abroad are the subject of particular concern to our industry, especially subsidized and state controlled exports and the practice of dumping."

That's a most important point for the American businessman to remember in assessing European competition for next year: There are no world-wide minimum wage laws, nor world-wide fair trade practices laws nor world-wide anti-trust laws, and Europeans will be using every advantage at hand to fashion the 1954 patterns of trade in their own favor.

STEEL's series on the economic presents and futures of the major Western European countries is concluded with this summary of the general situation. The series was prepared by STEEL's European staff headed by Vincent Delport. J. A. Horton gathered material for the article on Great Britain and Ernst Schroder prepared the German summary, both of which appeared Dec. 21. The Dec. 14 articles were prepared by Leon Jaudoin for France and Jacques Foulon for Belgium. Erick Hook made the analysis of Sweden and Dr. Mario d'Onoforio the analysis of Italy in the Dec. 7 issue. Complete iron and steel statistics for all industrial nations of the world will be carried in the 1954 Metalworking Yearbook issue Jan. 4.

the Small and the LARGE...



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The Records Topple in 1953 as Auto Men Finish a Banner Year

DID YOU KNOW more than one-third of all radio sets produced in the U. S. are used in automobiles? That automobiles today contain more light bulbs than an average five-room house? That more U. S. motor vehicles are exported to South America than to Europe and Asia combined? That school buses account for 70 per cent of annual U. S. bus output?

Matter of Facts—This quiz-show dynamite comes to you through the efforts of the Automobile Manufacturers Association which has just released impressive year-end computations. Chronicling the developments and implications of the auto industry, this mimeography will add an intellectual touch to any New Year's Eve party. Therefore a potpourri of excerpts follows.

Total automotive employment in the nation now exceeds 9.5 million. Included in the total are 930,000 employed in the manufacture of motor vehicles, parts and tires, more than 5.5 million in trucking and bus operations, nearly two million in motor vehicle sales and service, 280,679 in road building and maintenance and 291,957 in petroleum companies. Other automotive manufacturing, motor vehicle insurance and financing services with taxicab operations account for an estimated 600,000 additional jobs.

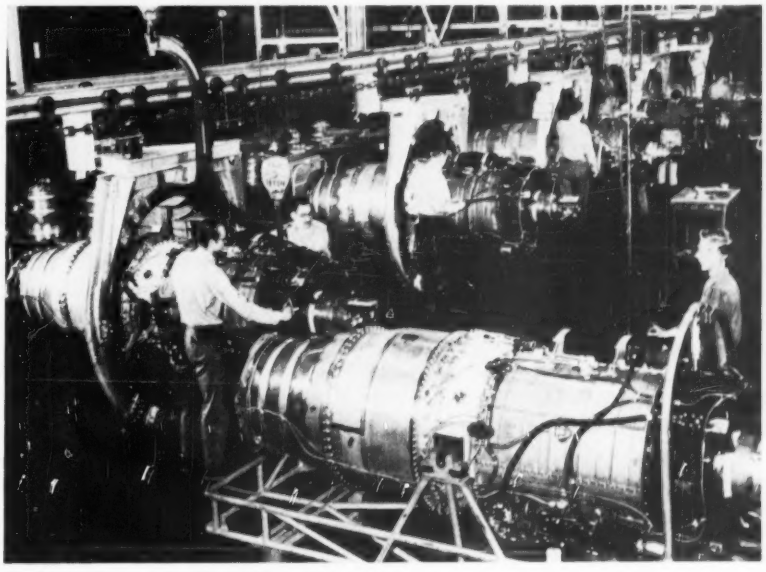
Matter of Money—Payrolls in the automotive industry set all-time records in 1953—$3.5 billion. The total employment figure includes 770,000 production workers who averaged 40.8 hours of work a week at an average hourly rate of $2.14. Weekly pay checks for production employees averaged $87.38. This marks the sixth straight year in which payrolls in the auto industry have increased.

Productionwise, auto plants in the U. S. turned out an estimated 7,370,000 motor vehicles during the year, a record second only to the 8,003,056 units produced in 1950. The year's production total represents a 33 per cent increase over 1952. It includes an estimated 6,165,000 passenger cars and 1,205,000 trucks and buses. Defense production accounted for nearly 20 per cent of the 1953 business.

Matter of Millions—The wholesale value of motor vehicle production hit a new high, estimated at $11,440 million. Of the total, passenger cars accounted for $9.15-billion and trucks and buses for $2.29 billion. Vehicle registrations rose to an estimated 54,745,000 units which is up nearly 1.5 million since 1952. Yet one-third of all passenger cars and one-fourth of all trucks still are prewar models. Four out of every five new vehicles produced merely replace those scrapped during the year.

Two downward trends were noted in the year's statistics. The number of passenger cars shipped abroad during 1953 increased to 180,000 from a 1952 total of 167,000, but the ratio of exports to total production slipped from 3.9 per cent to 2.9 per cent. Truck exports declined numerically from 162,000 to 132,000 and from 13.3 per cent of production to 10.9 per cent. Total truck production also dipped slightly, but it was the seventh consecutive year in which more than one million trucks were built by the industry.

Matter of Exports—Exports last year included $557.7 million in new and used vehicles, $476.1 million in parts and accessories and $89.7-million in tires and tubes. Trucks topped passenger cars in the export trade by about $70 million. Nearly 94,000 cars, trucks and buses were shipped to South American countries during the year,



Buick Power for the Air Force

Automakers keep their thumbs in plenty of pies. Buick Motor Division of General Motors Corp. is turning out these Wright J-65 jet engines for the Air Force at its plant in Willow Springs, Ill. Rated at over 7200 pounds thrust, these engines coming off the assembly line have power enough to fly a B-29 bomber

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with about 89,000 going to Central America and Canada. By comparison, Europe and Asia received only about 42,000 each. The leading countries in the U. S. automotive export are Mexico and Brazil. Each received more than 35,000 U. S. Motor vehicles.

Although the U. S. produces more automobiles than the rest of the world combined, it was the fourth largest importer of passenger cars in 1952. The nation received 33,306 foreign-made passenger cars during the year with Belgium and Luxemburg importing 71,327 units to lead. Top exporter of motor vehicles was Great Britain in 1952, exceeding U. S. foreign sales by 47 per cent. British exports during the year totaled 438,305 units including 309,832 passenger cars, 124,212 trucks and 4,261 buses.

Matter of Trucks—Records going back to 1922 show that the U. S. dominance in truck use has been diminishing slowly through the years, despite the fact that its total truck registration has been steadily increasing. Last year for the first time in history the U. S. had less than half of the world's trucks with a 48.3 per cent figure. In 1922 the nation's truck fleet represented 78.4 per cent ot the world total, 1,569,523 registrations. Last year with less than half, the total was 9,243,820 trucks on the road.

Four-door sedans, which accounted for 42 per cent of all passenger car sales in 1940, have climbed in popularity to the point where they accounted for 52 per cent in 1952. They have thus replaced the two-door sedan as the most popular body style. Two-door car sales slid from 54 per cent in 1940 to 29 per cent of car purchases last year. Hardtops climbed to 13 per cent last year with convertibles hovering at 2.5 per cent and station wagons rising to 3.9 per cent.

Matter of Roads—Adjusted to prewar purchasing power, the combined $5.3 billion total of federal, state and local funds spent on highways during 1953 will amount to only about $2.6 billion. This amount is just slightly more than was being spent in 1938, 1939 and 1940. Meanwhile the number of vehicles using the roads has increased more than 50 per cent, and traffic volume in terms of annual vehicle mileage is up by about 60 per cent. Officials estimate that $6-$7 billion annually is required to bring roads up to an adequate standard within the next 15 years.

Taxes continued their relentless bite in 1953. The resident of Michigan who paid $2000 for his car enriched the government by $583. The so-called luxury taxes and other levies took 29 cents out of every car purchase dollar. And taxes on parts, materials and transportation had amounted to $150 before the auto manufacturer had even received them.

Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,815	424,559
February	623,793	464,577
March	752,474	525,024
April	782,453	570,464
May	685,390	542,559
June	713,206	542,479
July	757,595	226,134
August	641,152	322,755
September	605,228	595,715
October	651,153	656,767
November		548,782
December		569,715
Total		5,989,509

Week Ended	1953	1952
Nov. 21	108,252	129,224
Nov. 28	74,290	117,315
Dec. 5	123,148	129,005
Dec. 12	113,145	121,590
Dec. 19	134,156	134,933
Dec. 26	136,000*	102,558

Source: Ward's Automotive Reports.
*Estimated by STEEL.

Matter of Spice—If you're still with us, here are some particularly spicy tidbits which almost certainly will make you a standout in any group:

U. S. motor vehicles traveled more than half a trillion miles in 1953, a distance equal to 31 round trips to each of the eight other planets in our solar system. To cover the same distance at 50 miles and hour, one car would have to travel 1,250,000 years.

The U. S. has more than three-quarters of the world's passenger cars.

In 1900, all of the hard-surfaced roads in the U. S. would not have reached from New York to Boston.

About 65 per cent of U. S. families own automobiles.

More cars and trucks are now being scrapped in one year than were produced in the U. S. from 1900 to 1915 combined.

Since 1900, more than 136 million motor vehicles have been produced in the U.S.

Passenger cars operated by rental and drive-yourself companies in the U. S. have doubled in number since 1950.

Taxicabs in the U. S. cover more than 4.5 billion miles per year.

Nearly 30 million people—45 per cent of all U. S. employed persons—use passenger cars in their work or in traveling to and from their jobs.

About 11 per cent of car owners in the U. S. have more than one car.

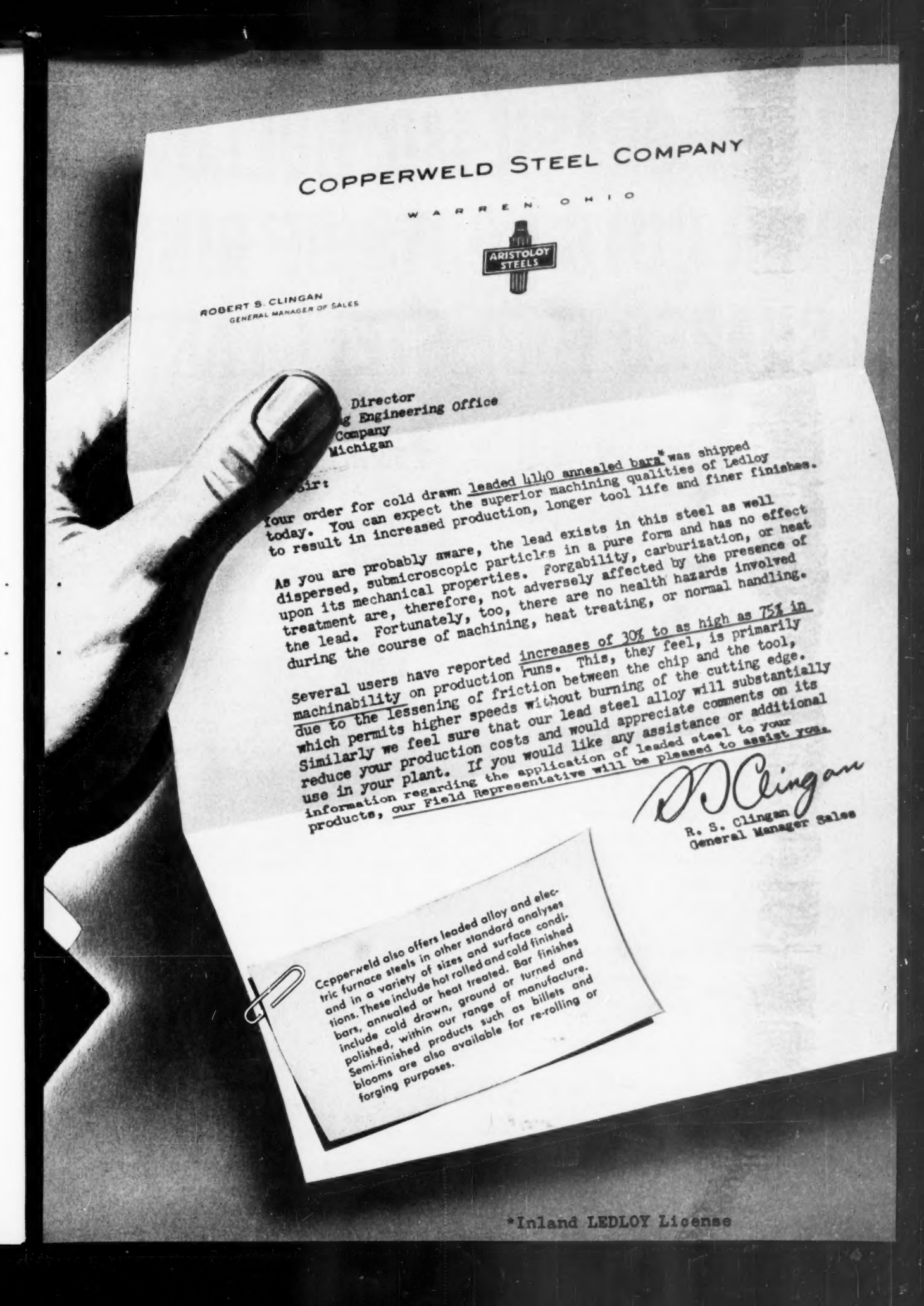
Surveys indicate that the man of the house usually has his way about the choice of a family car, but the woman has her word about its color.

U. S. Department of Commerce figures show one passenger car was exported in 1952 to Russia. No trucks, no buses.

Exhaust Notes

The Stevens trophy was awarded to Chrysler last week after a 1954 New Yorker deluxe model covered 2157 miles in 24 hours for an average of 89.89 mph. Speeds of over 120 mph on the straights and laps of over 97 mph on the Indianapolis track were logged by the car on regular grade gasoline and stock tires. Stutz, Marmon and Cord had held the trophy successively since it was established in 1927.

A knotty problem is what to do with the pension fund at Kaiser now that the Willow Run plant has been sold. An initial answer which may set an industry pattern for such situations is: Let the fund stay as it is to meet its obligations. The decision came from a neutral board headed by Dr. William Haber, University of Michigan professor. His feeling is that the fund must be preserved for the workers who become eligible for its benefits. Meanwhile ex-Kaiser workers who want to see the fund split up threaten to sue.


COPPERWELD STEEL COMPANY
WARREN OHIO
ARISTOLOY STEELS
ROBERT S. CLINGAN
GENERAL MANAGER OF SALES
Director
g Engineering Office
Company
Michigan
Sir:
Your order for cold drawn leaded 4140 annealed bars* was shipped today. You can expect the superior machining qualities of Ledloy to result in increased production, longer tool life and finer finishes.
As you are probably aware, the lead exists in this steel as well dispersed, submicroscopic particles in a pure form and has no effect upon its mechanical properties. Forgability, carburization, or heat treatment are, therefore, not adversely affected by the presence of the lead. Fortunately, too, there are no health hazards involved during the course of machining, heat treating, or normal handling.
Several users have reported increases of 30% to as high as 75% in machinability on production runs. This, they feel, is primarily due to the lessening of friction between the chip and the tool, which permits higher speeds without burning of the cutting edge. Similarly we feel sure that our lead steel alloy will substantially reduce your production costs and would appreciate comments on its use in your plant. If you would like any assistance or additional information regarding the application of leaded steel to your products, our Field Representative will be pleased to assist you.
R. S. Clingan
General Manager Sales
Copperweld also offers leaded alloy and electric furnace steels in other standard analyses and in a variety of sizes and surface conditions. These include hot rolled and cold finished bars, annealed or heat treated. Bar finishes include cold drawn, ground or turned and polished, within our range of manufacture. Semi-finished products such as billets and blooms are also available for re-rolling or forging purposes.
*Inland LEDLOY License

HOW GRAPH-MO® HOLLOW-BAR CUTS COSTS OF RING-SHAPED TOOL STEEL PARTS

1. MACHINES 30% FASTER

Free graphite in Graph-Mo's® structure cuts machining time 30% over other tool steels. It has a minimum tendency to pick up, scuff, seize or gall. It's also the most stable tool steel ever made. A typical Graph-Mo steel master plug showed less than 10 millionths of an inch dimensional change in 12 years!

2. ELIMINATES DRILLING

With Graph-Mo Hollow-Bar, drilling is eliminated because the center hole's already there. Finish boring is the first step. You save machining time. Available in sizes up to 16″ O.D. with a variety of wall thicknesses.

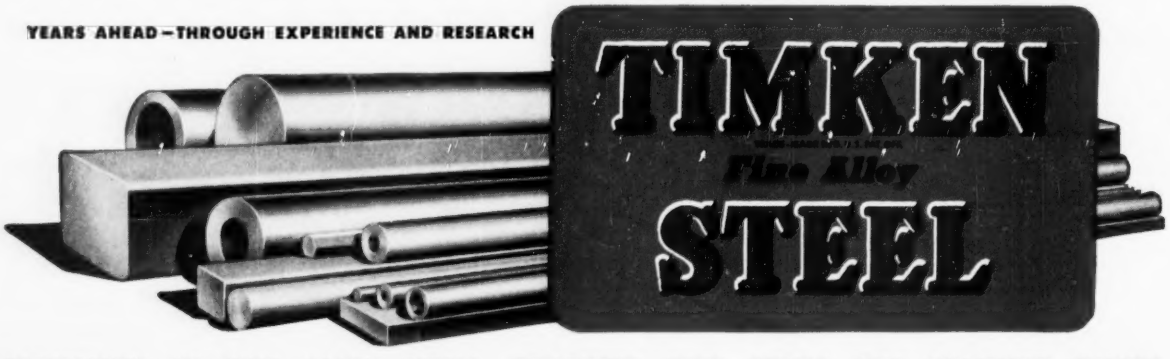
3. OUTWEARS OTHERS 3 TO 1

The combination of free graphite and diamond-hard carbides gives Graph-Mo unusual wear-resistance. Reports from users prove it outwears other tool steels an average of 3 to 1. And Graph-Mo responds uniformly to heat treatment.

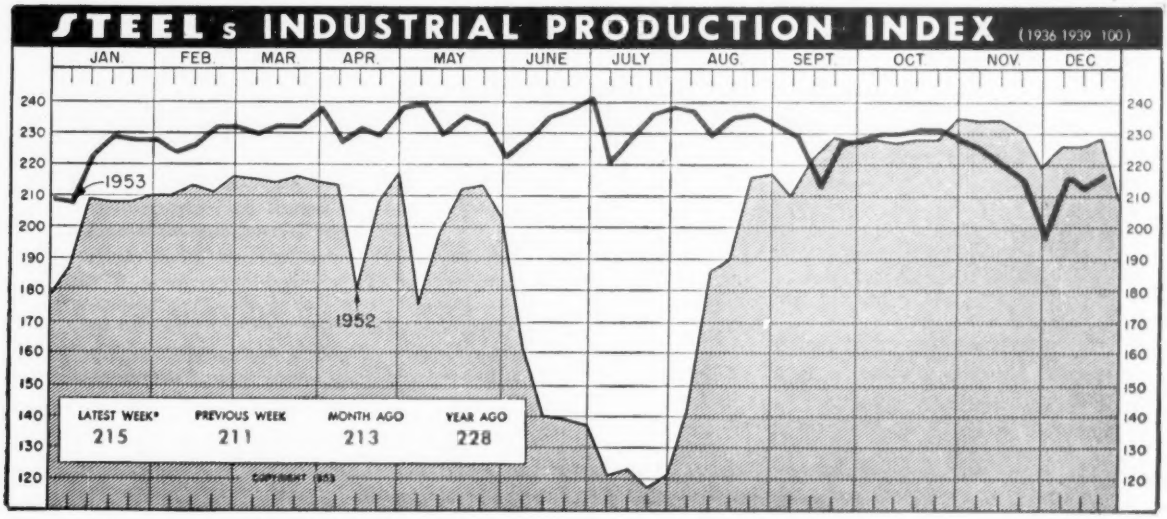
4. MORE PARTS PER TON

You start closer to your finished product with Graph-Mo Hollow-Bar. You machine away a minimum of steel, cut scrap loss. Graph-Mo Hollow-Bar is distributed through A. Milne and Co. and Peninsular Steel Co. warehouses. For more information about Graph-Mo Hollow-Bar, write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO."

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



*Week ended Dec. 19. Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automotive Assemblies (Wards' Reports) 20%.

Production: New Index Reveals New Heights

THE Federal Reserve Board's revised industrial production index is like a new prescription for glasses—it brings into sharp focus postwar changes in industrial output by using a 1947-1949 lens instead of a 1935-39 one.

Past Performance Reappraised—Unlike the old index, the change in base period and other improvements enabled the new index to surmount the World War II production peak, a feat achieved in 1952.

Based on the new index, production expanded 35 per cent between the beginning of 1947 and early 1953. All three major divisions of output, durable, nondurable and minerals, showed larger gains than under the former index, when their combined growth over the same period was only 27 per cent.

How Great Was '49 Decline?—Seasonal factors accounted for a greater part of the 1948-49 "inventory recession" than was previously apparent. Production fell only 10 per cent from the 1948 high, instead of 17 per cent.

New Production "Look" . . .

With the new index seemingly more sensitive to the enlarged postwar economy, the recent production slide is seen to have occurred faster, almost twice as fast, and to have cut slightly deeper than was previously thought. But, first-quarter automobile scheduling makes it unlikely that total outturn will continue to decline during those months.

Present Production Facts—Under the revised index the postwar production pinnacle was reached in July of this year—the old index attained its zenith four months earlier, in March. By October, industrial outturn had declined about 4 per cent under the new, and 5 per cent under the old index.

During the latest month, October, the new index registered a preliminary 132 per cent of the 1947-1949 average, compared with an old index showing of 231 per cent of the 1935-1939 average.

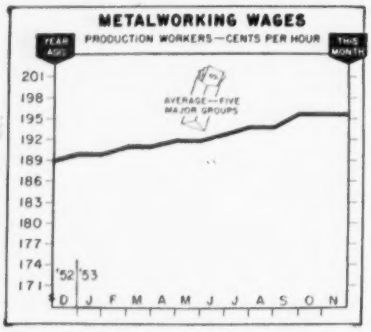
Rise Before Holidays — On a weekly basis, STEEL's industrial production index rose a preliminary 4 percentage points above the previous week and registered 215 per cent of the 1936-1939 average in the week ended Dec. 19. Speedup of automobile outturn alone caused the temporary preholiday gain. Peak production of 1954 is expected to be reached during the first quarter.

Dividend Declarations Down . . .

Reduced business pace of the last several months has shown up in a further paring of cash dividend payments, according to the Office of Business Economics. Whereas corporate disbursements of $6831 million in the first eleven months of 1953 were still 4 per cent above the comparable period in 1952, the same percentage gain as in the first ten months, payments during November were 8 per cent below November of last year, compared with October disbursements, which were only 2.5 per cent less than those of the same month in 1952.

Wholesale Prices Slide . . .

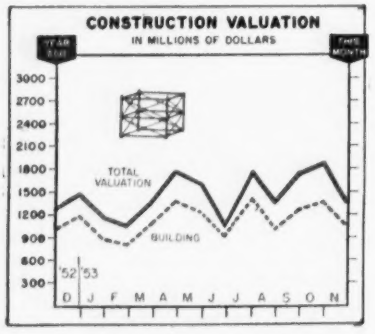
Not only did the wholesale price index of the Bureau of Labor Statistics dip slightly during October and November, but the price slide extended to all commodities other than farm and foods. From 111.0 per cent in September and 110.2 in October, prices for all commodities in November slid further to 109.8 per cent of the 1947-1949 average,



Metalworking Wages
(cents per hour)

Production Workers—Five Major Groups	Prim.	Fab.	Mach-	Elec.	Trans.
1952	Mtls.	Prod.	inery	Mchy.	Equip.
Nov.	200	179	190	170	204
Dec.	201	181	192	170	204
1953					
Jan.	203	181	193	172	203
Feb.	201	182	194	173	205
Mar.	201	183	195	173	205
Apr.	201	183	195	174	206
May	202	183	195	174	205
June	205	184	195	175	207
July	209	185	195	176	207
Aug.	208	185	196	177	206
Sept.	212	186	198	178	207
Oct.	208	187	199	177	209
Nov.	208	186	199	178	209

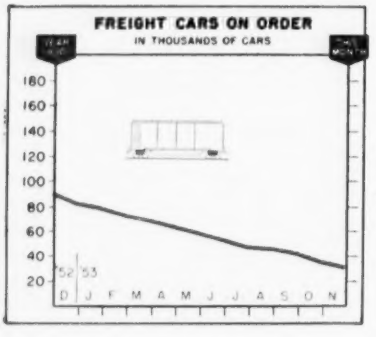
U. S. Bureau of Labor Statistics.



Construction Valuation
(37 States)—In Millions of Dollars

	Total		Building	
	1953	1952	1953	1952
Jan.	1,075.9	902.1	867.0	695.4
Feb.	1,021.3	885.2	792.9	697.8
Mar.	1,347.5	1,321.3	1,054.4	1,056.0
Apr.	1,741.5	1,597.5	1,354.2	1,243.9
May	1,606.1	1,563.6	1,219.8	1,216.2
June	1,115.5	1,488.8	922.3	1,133.3
July	1,793.3	1,511.3	1,417.8	1,170.8
Aug.	1,414.4	1,438.7	1,053.4	1,147.5
Sept.	1,741.7	2,039.2	1,290.7	1,790.8
Oct.	1,892.4	1,310.1	1,392.7	1,072.8
Nov.	1,394.1	1,248.8	1,096.0	989.9
Dec.	.....	1,467.4	.....	1,147.7
Total	.....	16,774.9	.....	13,362.1

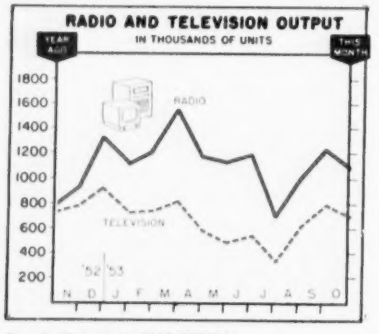
F. W. Dodge Corp.



Freight Car Awards and Backlogs

	Awards		Backlogs	
	1953	1952	1953	1952
Jan.	5,536	5,338	77,414	120,251
Feb.	2,284	7,358	71,883	118,900
Mar.	3,379	5,619	68,553	115,854
Apr.	2,432	397	62,637	108,270
May	1,651	2,502	57,345	103,910
June	1,463	3,264	52,315	99,615
July	1,632	1,536	47,423	95,265
Aug.	3,913	4,558	45,735	95,761
Sept.	3,914	3,628	42,198	95,377
Oct.	1,705	1,423	35,171	90,708
Nov.	2,860	2,878	31,869	87,657
Dec.	....	1,159	.....	80,296
Total	....	37,261		

*End of month.
American Railway Car Institute.



Radio and Television Output
Thousands of Units

	Radio		Television	
	1953	1952	1953	1952
Jan.	1,093	632	719	405
Feb.	1,192	759	731	409
Mar.	1,549	976	810	511
Apr.	1,158	848	568	323
May	1,109	748	482	309
June	1,164	874	524	361
July	674	442	316	199
Aug.	992	544	604	398
Sept.	1,217	866	770	756
Oct.	1,052	772	680	724
Nov.	....	924	...	780
Dec.	....	1,325	...	921
Total	....	9,711	...	6,096

Radio-Electronics-Television Mfrs. Assn.

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Issue Dates on other FACTS and FIGURES Published by STEEL

Durable Goods ....Dec. 14	Indus. Production..Nov. 23	Ranges, Gas .....Oct. 12
Employ., Metalwk..Nov. 30	Ironers .....Nov. 23	Refrigerators .....Nov. 2
Employ., Steel ....Nov. 30	Machine Tools ....Dec. 7	Steel Castings ....Dec. 14
Fab. Struc. Steel ..Dec. 21	Malleable Castings.Dec. 14	Steel Forgings ....Dec. 7
Foundry Equip. ...Dec. 21	Prices, Consumer ..Dec. 7	Steel Shipments ...Oct. 12
Furnaces, Indus. ..Dec. 7	Prices, Wholesale .Nov. 30	Vacuum Cleaners .Oct. 12
Gears .....Dec. 21	Pumps .....Nov. 16	Washers .....Dec. 21
Gray Iron Castings.Dec. 14	Ranges, Elec. .....Nov. 2	Water Heaters ....Nov. 9

while prices for commodities other than farm and foods declined from 114.7 in September to 114.5 in November. The component index of metals and metal products remained unchanged in the latest month as higher prices for pig tin, mercury, steel scrap and secondary nonferrous metals were balanced by lower prices for electric building wire, ignition cable, and a fractional decline for cold-rolled carbon steel strip.

Construction Records . . .

With construction contract awards in the 37 states east of the Rockies in the first eleven months totaling $16,144 million, 5 per cent more than in the same period in 1952, the construction industry was within $631 million of besting last year's record, says F. W. Dodge Corp.

Housing Decline Slight . . .

During November, nonfarm housing starts declined less than seasonally to 80,000, the Bureau of Labor Statistics says. The decrease was in starts of privately owned housing, which were down by 11 per cent over the previous month, compared with a customary 18 per cent drop at this time during the three previous years. The 11-month total of 1,031,300 new nonfarm housing starts was slightly less than the 1,055,500 units begun in the same 11 months of 1952 and was minutely above the 1,030,500 units under construction during the corresponding period in 1951.

Each Person's Castle . . .

Residential construction put into place during 1953 will have a value of $11.7 billion, the Office of Business Economics reports. Mortgages on one-to-four family dwellings currently amount to about $65-billion, compared with $58.2 billion a year ago, and $18.5 billion just before and after World War II. More dwellings are now owned by occupants than in the "twenties," somewhat more than half are free of mortgages, and the overall equity in mortgaged homes amounts to about 55 per cent of the homes' market value, a ratio slightly higher than in 1940 but

BAROMETERS OF BUSINESS

	LATEST PERIOD	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	83.5	85.0	105.5
Electric Power Distributed (million kwhr)	8,700[1]	8,661	8,280
Bitum. Coal Output (daily av.—1000 tons)	1,404	1,367	1,688
Petroleum Production (daily av.—1000 bbl)	6,223[1]	6,225	6,611
Construction Volume (ENR—millions)	$181.7	$655.1	$167.3
Automobile, Truck Output (Ward's—units)	134,156	113,145	134,933
TRADE			
Freight Car Loadings (unit—1000 cars)	630[1]	652	710
Business Failures (Dun & Bradstreet, no.)	200[1]	216	141
Currency in Circulation (millions)[3]	$30,953	$30,904	$30,487
Dept. Store Sales (changes from year ago)[3]	−3%	−3%	+4%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$19,503	$17,191	$19,420
Federal Gross Debt (billions)	$274.9	$275.0	$267.0
Bond Volume, NYSE (millions)	$16.3	$14.9	$20.7
Stocks Sales, NYSE (thousands of shares)	8,014	7,069	9,540
Loans and Investments (billions)[4]	$80.4	$80.5	$78.4
U. S. Gov't Obligations Held (billions)[4]	$32.7	$32.8	$32.8
PRICES			
STEEL's Finished Steel Price Index[5]	189.74	189.74	181.31
STEEL's Nonferrous Metal Price Index[6]	206.2	206.6	213.2
All Commodities[7]	110.1	110.1	109.6
Commodities Other Than Farm & Foods[7]	114.5	114.5	112.9

[1]Dates on request. [2]Preliminary. [3]Weekly capacities, net tons: 1953, 2,254,459; 1952, 2,077,040. [4]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

about equal to the proportion of the late "twenties"—during another housing boom.

Expediting Our Economy . . .

Although the decrease in government spending for materials handling equipment has caused factory shipments to decline from the 1952 average, shipments during September rose to June levels, according to the Material Handling Institute. Industry executives believe that the expansion of existing markets and the development of new ones will more than make up for the decline of government buying. The chart below, with a January, 1948, to June, 1950, base period, illustrates the great attention that has been paid to materials handling equipment since the start of the Korean war.

New Markets: A Lift for Materials Handling Equipment

Material Handling Institute.

whatever SCREW he specifies...

pheoll makes it!

NEED SCREWS? Pheoll offers the most complete line (over 10,000 standard sizes, types, head styles and finishes). Pheoll maintains the largest stocks anywhere. Pheoll gives you prompt, reliable service. Call Pheoll on your next order.

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SPECIAL COLD HEADED PRODUCTS

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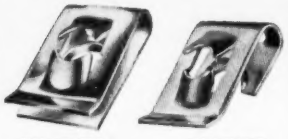


"U" TYPE "J" TYPE

SPEED NUTS®

are one-piece, self-locking, spring steel fasteners. Snap over panel edges or center hole locations . . . self retained in screw-receiving position for easier, faster assembly in "blind" locations. Available for a full range of screw sizes and panel thicknesses.

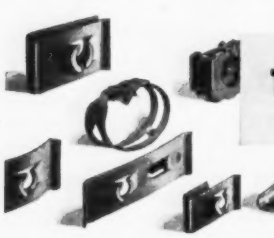
SPEED NUTS Saved 6,144 Assembly Hours, Thousands of Production Dollars

Reports the Trane Co., LaCrosse, Wisconsin

"Every time we use a SPEED NUT, we save 14 seconds in production time", say Trane engineers. In one year, this leading manufacturer of air conditioning, heating and ventilating equipment netted 6,144 extra assembly hours, plus amazing savings in materials and materials handling. Misalignment of ventilator weld nuts and mounting holes slowed production continuously. Replacing them with "U" type SPEED NUTS, which snap in place by hand and provide floating alignment, ended this bottleneck. Costly installation of convector heater coil headers was overcome with "J" type SPEED NUTS. Snapped directly on frame members, they eliminated eight cast iron drilled and tapped ears and two welded support brackets. SPEED NUTS, applied after painting, eliminated masking or retapping of threads–licked rust problems.

Call in your Tinnerman representative for a FREE fastening analysis of your product . . . he may find comparable savings for you through greater fastening efficiency.

Send today for your copy of "SPEED NUT Savings Stories", a booklet of savings for industry. Write: TINNERMAN PRODUCTS, INC., Box 6688, Dept. 12, Cleveland 1, Ohio. *In Canada:* Dominion Fasteners, Ltd., Hamilton, Ontario. *In Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales. *In France:* Aerocessoires Simmonds, S. A.–7 rue Henri Barbusse, Levallois (Seine).



TINNERMAN Speed Nuts®

MORE THAN 8000 SHAPES AND SIZES

J. M. TOUGH
. . . Watson-Stillman Fittings sales mgr.

J. M. Tough was appointed sales manager, **Watson-Stillman Fittings Division,** H. K. Porter Co. Inc., Roselle, N. J. He joined the company in 1942 and later became district manager of the Chicago territory.

M & N Hydraulic Press Co., Clifton, N. J., appointed **Kenneth Y. Ryan** general sales manager. He previously was associated with Brown Instrument Division, Minneapolis-Honeywell Regulator Co. and Bethlehem Steel Co. He will be at the company's Clifton plant.

L. M. Craig is now president, **Southern Engineering Co.,** Charlotte, N. C., and **B. F. Armstrong** is purchasing agent. **B. O. Hood** has retired and **S. V. Davenport** has left the company.

Russell S. Johnson was appointed director of sales, **Eclipse Machine Division,** Bendix Aviation Corp., Elmira, N. Y. He was in charge of the Detroit sales engineering office.

Victor E. Rennix, regional sales manager in Chicago since 1946 for **Electro-Motive Division,** General Motors Corp., was promoted to general sales manager. He is replaced by **George W. Rukgaber,** formerly Chicago district sales manager. Mr. Rennix succeeds **W. N. Fritts,** who was transferred to special assignment.

ERNEST A. FENTZLAFF
. . . joins Consolidated Industries

Consolidated Industries, West Cheshire, Conn., producer of quality forgings, appointed **Ernest A. Fentzlaff** as sales engineer responsible for sales to the aircraft industry. Previous associations were with Wright Aeronautical Engine Division, Curtiss-Wright Corp., as production engineer, and with Engineering & Research Corp. and Piasecki Helicopter Corp.

Russell E. Reynolds was named sales engineer for **Udylite Corp.** He will work in the Pennsylvania district with headquarters in the Cleveland office.

George R. Kloppman, National Screw & Mfg. Co. secretary-treasurer, was elected a director of the Cleveland firm.

Edmund Q. Sylvester, formerly executive vice president, was elected president of **Griffin Wheel Co.,** Chicago, subsidiary, American Steel Foundries. **Herbert J. Rosen,** president since 1948, becomes chairman of the executive committee. **John W. Brittingham,** formerly vice president-treasurer, was elected first vice president, and **Cedric P. Voll** becomes treasurer and controller.

R. B. Sayre was elected a vice president, **Graybar Electric Co.,** New York. He has been assistant vice president since 1952.

H. A. ROWBOTHAM
. . . v. p. of Phoenix Bridge Co.

H. A. Rowbotham was elected vice president of **Phoenix Bridge Co.,** Phoenixville, Pa., subsidiary of Barium Steel Corp. Mr. Rowbotham was for many years with Belmont Iron Works as vice president of purchasing and traffic.

At **Republic Steel Corp.'s** Youngstown steel plant **G. N. Harmon** was named superintendent, electrical department, and **R. C. Stern** superintendent, masonry department. **Albert W. Groesbeck** was made assistant superintendent, electrical department, at the Warren, O., district steel plants.

Rezolin Inc., Los Angeles, appointed **Norry W. Hastings** to head its product development division.

John W. Bodwell was appointed manager, work order department, Chicago plant, **Joseph T. Ryerson & Son Inc.** He has been work order manager at Cleveland.

James P. Murray Jr., senior salesman in the Pittsburgh district of **Dingle-Clark Co.,** was appointed vice president in charge of that area. He succeeds the late **Harry M. Leathers. Robert G. Smith,** purchasing agent, was transferred to the construction sales department with headquarters in Cleveland. He is succeeded as purchasing agent by **G. S. Wilkinson.**

International Business Machines

RONALD P. MONTGOMERY

JOSEPH POMMERSHEIM

F. P. MAXWELL

. . . new appointments within Rockwell Mfg. Co.'s organization

Corp., New York, appointed **Edwin S. McCollister** and **R. B. Smith** as special representatives in its electronic data processing department.

Kermit D. Collom and **Stanley E. Jacke** were appointed to the staff of the new ultrasonics division of **Detrex Corp.**, Detroit.

B. F. Goodrich Co., Akron, announces retirement of **Dr. Howard E. Fritz**, vice president in charge of research.

Changes in branch office personnel of **A. Milne & Co.** include **Harvey C. Blesch**, now manager of the St. Louis office; **John I. Kitts**, who replaces **H. D. Groth**, resigned, as manager at Cleveland; **Carl F. Rand**, now manager at Dayton, O., who is replaced as manager at the Worcester, Mass., office by **Frank R. Sanning.**

Raymond J. Bryan, manager of **Allegheny Ludlum Steel Corp.'s** plant in Tonawanda, N. Y., retired.

Jack L. Mustard was made assistant general sales manager, industrial division, **Ex-Cell-O Corp.**, Detroit. He has been assistant sales manager of the firm's precision products division.

Norman G. Fleck, former assistant general superintendent, Buffalo Arms Inc., is now assistant general manager, Manzel Division, **Frontier Industries Inc.**, Buffalo.

Changes announced by **Rockwell Mfg. Co.** include: **Ronald P. Montgomery**, a buyer in the general purchasing department in Pittsburgh, was made purchasing agent for Rockwell Meters Inc., subsidiary which will operate a new water meter plant nearing completion at Uniontown, Pa. **Joseph Pommersheim**, a project engineer at Rockwell's Homewood plant, was promoted to chief engineer of the Norwalk, O., plant. **F. P. Maxwell** resigned as president of Acro Mfg. Co., Columbus, O., to fill the newly created position of vice president of Rockwell's power tool division, Pittsburgh. **Dr. Charles J. Kentler** was named technical consultant for the meter and valve division.

Loren C. Miller succeeds **L. H. Burr**, retired, as works manager of **Austin Co.'s** structural steel fabricating division (Bliss Mill), Cleveland, where, since 1952, he has served as assistant manager.

Ernest D. Fischer, service engineer in the Alabama territory, was made manager of **Thor Power Tool Co.'s** new factory branch office in Atlanta.

At U. S. Steel Corp.'s **American Steel & Wire Division**, Cleveland, the following were named to new posts in the industrial relations department: **Alex C. Davidson Jr.** is director of industrial relations-safety, **Robert J. Grenfell** is supervisor of labor relations and **Edwin O. Kumler** is supervisor of safety. Moving to the AS&W Joliet, Ill., plant from Cleveland is **Rea C. Helm Jr.**, who becomes superintendent of industrial relations for that plant.

Howard A. Reinhart, active for the last 15 years in both design and sales in the materials handling field, has become associated with **Ohio Equipment Co.**, Cleveland.

Parker Appliance Co. appointed **Herbert H. Walley Jr.** Boston area sales engineer and **R. G. Dee** Los Angeles sales engineer.

Wagner Bros. Inc., Detroit, appointed **Roger E. Marce** to its sales and service staff.

George R. Forbes Jr. joined the New York sales staff of **L. B. Foster Co.** He was formerly assistant general manager of John R. Forbes Foundry & Iron Works.

John P. Tansey was appointed national service manager of **Motorola Inc.'s** communications and electronics division, Chicago. He succeeds **Fred Schnell**, now staff assistant to the vice president.

Crucible Steel Co. of America, Pittsburgh, appointed **George F. Groff** controller and **Daniel A. Porco** assistant controller.

Theodore P. Witkowski joined General Electric Co.'s **Carboloy Department**, Detroit, as an engineer

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FAWICK *Airflex*
INDUSTRIAL CLUTCHES AND BRAKES

SAM DuPREE
. . . a gen. mgr. for Goodyear

JAMES E. FIFIELD
. . . Ductile Iron Foundry v.p.-gen.mgr.

J. KNEELAND NUNAN
. . . heads Consolidated Vacuum Corp.

in the metallurgical process and quality control unit for permanent magnet materials at the Edmore, Mich., plant.

At **Goodyear Tire & Rubber Co.**, Akron, **Sam DuPree** was made general manager of all industrial products and **Herman R. Thies** general manager of all chemical products. Both are newly created positions. Before appointment in 1947 as assistant manager of industrial products, Mr. DuPree served as sales manager at the St. Marys, O., molded goods plant.

W. L. Brazeau joined **Mercantile Metal & Ore Corp.**, New York, as vice president. Mr. Brazeau has specialized in the international marketing of ores and metals for the last 27 years. He had prior association with American Smelting & Refining Co., International Selling Corp., W. R. Grace & Co.

Reuben W. Pelto was appointed sales manager, **Ready-Power Division**, Ready-Power Co., Detroit.

James E. Fifield was named vice president and general manager of the newly reorganized **Ductile Iron Foundry Inc.**, Stratford, Conn. He was formerly with New England technical field section of International Nickel Co. Inc. **Henry D. Phillips**, president of Hartford Electric Steel Co., will also serve as president of Ductile Iron Foundry. **Walter P. Jacob** is chairman of both concerns.

I. W. Strong, Denver sales representative of **Appleton Electric Co.**, was appointed assistant to the vice president in charge of sales, and moves to Chicago, Appleton home office.

J. Kneeland Nunan is now president of **Consolidated Vacuum Corp.**, Rochester, N. Y., subsidiary of Consolidated Engineering Corp. He became executive vice president of the Rochester high-vacuum equipment firm early in 1953. **Philip S. Fogg**, former president, now serves as chairman of the board.

Peter H. Simon is now comptroller, Security Engineering Division, **Dresser Operations Inc.**, Los Angeles.

G. D. Gillen, formerly sales representative for the New York district office, **Detroit Steel Corp.**, was made assistant manager of sales, same district.

Harold G. Williams, consulting metallurgist specializing in beryllium copper, is now representing **Penn Precision Products Inc.** in metropolitan New York area.

Arthur D. Schwope joined **Brush Laboratories Co.**, Cleveland, division of Clevite Corp., as director of metallurgical research. He was formerly with Battelle Memorial Institute, Columbus, O.

Guerdon S. Allen, secretary, and **Stewart S. Shaft**, treasurer, were elected executive vice presidents of **Nutting Truck & Caster Co.**, Faribault, Minn.

Telecomputing Corp., Los Angeles, appointed **H. G. Ayers** special assistant to the president.

David Reid Jr. was made manager, abrasive and bond plants, at **Norton Co.**, Worcester, Mass., to replace **Albert E. Hall**, retired. **Robert G. Clarke** succeeds Mr. Reid as superintendent, abrasive and bond plants.

T. Y. Gehr was made manager of **Pullman-Standard Car Mfg. Co.'s** track equipment department, Chicago. He succeeds **John A. Curtis**, who joins Westinghouse Electric Corp.

William O. Bosserman now heads the anodes division of **Sipi Metals Corp., Chicago.** He was named managing engineer.

Wilbur D. Hays joined **Reliable Spring & Wire Forms Co.**, Cleveland, as chief estimator. He was formerly with Cleveland Wire Spring Co. for 25 years.

R. A. Knight was made assistant sales manager, equipment division, **National Research Corp.**, Cambridge, Mass.

Charles D. McCall was appointed to a new position as manager of automotive engineering within the engineering department of General Motors Corp.'s **New Departure Division**, Bristol, Conn. Named to succeed Mr. McCall as New Departure's general sales manager is **Robert T. Collins**, formerly Meri-

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No small factor in the astounding industrial growth of the Delaware Valley is the unexcelled transportation the area offers to both shipper and buyer.

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1982

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WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION
CLAYMONT, DELAWARE

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den, Conn., plant manager for the division.

Luther S. Smith, retired Air Force brigadier general, has joined **Temco Aircraft Corp.,** Dallas, as special assistant to the president.

W. J. Riley was elected treasurer and assistant secretary of **Lyon Inc.,** Detroit.

Spencer Bowman is now in charge of mining research development of Le Roi Co.'s **Cleveland Rock Drill Division,** Cleveland. He will direct development of a new continuous mining machine which utilizes the principle of the experimental model developed by Bituminous Coal Research Inc. He has been with the latter organization as assistant to the director of mining development.

Marsam Steel Corp. representatives appointed to cover following areas include **Sidney Norwood** and **E. H. Krauss,** Michigan; **C. A. Wright,** northern Pennsylvania and western New York; **Murray A. Magloff,** New York and New England; **W. R. Murphy,** eastern Pennsylvania and southern New Jersey; and **W. Davis,** Indiana-Kentucky.

M. E. Stern was appointed vice president and assistant treasurer, **Brook Motor Corp.,** Chicago, a newly organized subsidiary of Brook Motors Ltd., England. **Peter L. Loewe** was named vice president and assistant secretary.

Carleton Ellis Jr. was appointed director of sales for all products of the Plaskon Division, **Allied Chemical & Dye Corp.,** New York.

DR. ADOLPH J. LENA
. . . Allegheny Ludlum associate dir.-research

Dr. Adolph J. Lena was appointed associate director of research at **Allegheny Ludlum Steel Corp.,** Pittsburgh, in charge of the physical metallurgy section of the research department. He was formerly research metallurgist.

Williams Steel & Supply Co. appointed **Richard A. Villacres** Minnesota district sales manager.

W. J. Stoddard was named district supervisor in the Michigan district for the metal processing department of **Pennsylvania Salt Mfg. Co.,** Philadelphia.

Emerson W. Johnson joined **Wisconsin Steel & Tube Corp.,** Milwaukee, as sales representative for Wisconsin.

Howard A. Simons, with headquarters in Cleveland, will represent **American Buff Co.** in the northern Ohio district. For the last three years he was with Diebolt Safe & Lock Co.

M. H. Hobbs was made manager of **Westinghouse Electric Corp.'s** switchgear division, Pittsburgh. He succeeds **J. B. MacNeill,** who joins the staff of John K. Hodnette, vice president-industrial products. **Harry W. Tenney** was appointed administrative assistant to W. O. Lippman, vice president of the elevator division in Jersey City, N. J. **C. M. Laffoon** was made assistant manager, transportation and generator division.

J. T. Connell was appointed contract manager, marine repair department, **Dravo Corp.'s** engineering works division, Pittsburgh.

Lewis-Shepard Products Inc. appointed **Thomas M. Murphy** district sales manager of the industrial area surrounding Chicago.

Cyril Bath Co., Solon, O., appointed **Charles R. Youmans** to its sales staff.

Combustion Control Corp., Boston, appointed **Arne Lovendahl** manager of its Philadelphia area office.

Dravo Corp., Pittsburgh, appointed **Dr. John A. Anthes,** chemical engineer, as a sales project engineer for its machinery division.

Wagner Electric Corp., St. Louis, elected **Edward G. Holtzman** assistant secretary and assistant treasurer to succeed **L. W. McBride.**

OBITUARIES...

Ralph H. Norton, 78, who retired in 1948 as chairman of **Acme Steel Co.,** Chicago, died Dec. 14 in Florida. He served as president from 1923 to 1941.

Albert G. Lindsay, manager of **Rockwell Mfg. Co.'s** export and international divisions, died Dec. 4 in New York. Former manager of Crosley Corp.'s foreign divisions, he joined Rockwell last April and headquartered at Pittsburgh.

Emanuel Janitzky, 72, metallurgist who served for more than 30 years with **Carnegie-Illinois Steel Co.** at South Works, Chicago, before retiring in 1945, died Dec. 13.

Edward T. Edwards, 76, former vice president-general manager of **Latrobe Electric Steel Co.,** Latrobe, Pa., now Latrobe Steel Co., died Dec. 10.

Arthur M. Duncan, 67, purchasing agent, **Rust Engineering Co.,** Pittsburgh, died Dec. 9.

Hugo J. Kurtz, chairman of the board and co-founder of **Peninsular Steel Co.,** Detroit, died Dec. 15.

Charles H. Bunch, 61, co-founder, chairman and treasurer of **Acme Electric Corp.,** Cleveland, died Dec. 8.

William H. Nikola, a metallurgist with **Westinghouse Electric Co.** in Philadelphia, died Dec. 17.

Edwin F. Brown, 72, retired executive of U. S. Steel Corp.'s **American Steel & Wire Division,** Cleveland, died Dec. 19 in Orlando, Fla. For a number of years before retirement in 1946, Mr. Brown was general superintendent of the American, the Consolidated and the Newburgh wire works plants for the division.

THE BURLINGTON LIARS' CLUB
SPINS A YARN FOR BAKER'S MAGDOLITE

Dinner on the Run

A crusty old sourdough settled down to camp one night beside a butte in Western Kansas. While he was cooking his meal, the wind whipped around the butte, scattered his coals and started a prairie fire. The point that made the old-timer hopping mad was that his supper was only half cooked . . . and he had no more fuel.

So, grabbing his coffee pot in one hand and his skillet in the other, he lit out after the prairie fire. "You know," he said afterwards, "the wind was blowing so hard that I chased that doggoned fire for five miles before I got my bacon fried!"

Chasing a prairie fire to cook your dinner is almost as bad as running around to locate a dependable source of dolomite. Fortunately, if you are a customer of The J. E. Baker Company, this presents no problem. Three plants, located in York and Billmyer, Pennsylvania and Millersville, Ohio, assure you of always having an adequate supply of BAKER'S MAGDOLITE, the original deadburned dolomite. You can depend upon the superior chemical, physical and mineralogical composition of BAKER'S MAGDOLITE. It's always five ways better . . . Composition, Preparation, Economy, Strength, Quality.

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Plants: York, Billmeyer, Pennsylvania — Millersville, Ohio

McLouth Awards Contracts

Rust Furnace and Hall Engineering participate in $100-million project

VAST EXPANSION project of McLouth Steel Corp., Detroit, at its Trenton, Mich., Works, may be virtually completed by August of 1954.

The $100-million installation will be powered and lighted from one end to the other by Hall Engineering Co., Detroit, electrical contractor. J. T. Jones, secretary-treasurer of the firm, estimates the cost of the work at between $5 million and $7 million.

The electrical project involves a complete electrical system, ranging from incoming power lines at 24,000 volts to tandem finishing mill installation and additional pickling facilities. New ore docks, bridges and storage yards will receive the iron ore which will be refined to the ingot state by a blast furnace and two 200-ton electrical arc furnaces.

Construction—New buildings requiring both power and lighting will be constructed for the additional arc furnaces, soaking pits, finishing mill and pickling lines.

Contract for designing and construction of a slab heating furnace and five batteries of soaking pits for the Trenton Works was awarded by McLouth Steel to Rust Furnace Co., Pittsburgh. These facilities will serve the hot strip mill. The slab reheating furnace will have a capacity of 125 tons per hour. The five batteries of soaking pits of two holes each will double the mill's soaking pit capacity.

As previously reported (STEEL, Nov. 30, p. 88), Dravo Corp., Pittsburgh, will furnish and erect facilities for new boilers and turboblowers, ore bridges and dock, pumps and piping.

Firth Sterling Moves Branches

Firth Sterling Inc., Pittsburgh, manufacturer of tool and die steel, sintered carbides and high temperature materials, is streamlining its sales and distribution facilities. As part of this program, the firm established an office at 200 North Ave., Westfield, N. J., combining the Philadelphia and New York offices at one headquarters. Howard M. Dawson is manager of the mid-eastern district.

Firth Sterling moved its Ohio district office to 2250 Euclid Ave., Cleveland. Stuart A. Smith is district manager. New address of its southern district office is 2201 Highland Ave., Birmingham.

Jessop To Assist French Firm

Jessop Steel International Corp., foreign operating subsidiary of Jessop Steel Co., Washington, Pa., concluded a technical assistance agreement with a major French steel producer for the manufacture of clad steel plates. Name of the French mill was not disclosed.

White-Roth Appoints Agent

White-Roth Machine Corp., Lorain, O., appointed Motch & Merryweather Machinery Co., Cleveland, as regional distributor for its new tumbling machine.

Foundry Leases More Space

Baltimore Alloy Foundry Inc. has equipped space at 1212 Edythe St., Baltimore, for nonferrous casting production. John N. Matricciani is partner.

Vanadium-Alloys Expanding

Vanadium-Alloys Steel Canada Ltd., London, Ont., will complete its $1-million reconstruction program early in 1954. Efficient operation of the new plant is expected to be attained by spring.

Hoffman Radio Builds Plant

Hoffman Radio Corp., Los Angeles, increased production capacity by 40 per cent with completion of a $1-million radio and television factory at Kansas City, Mo.

Oliver Buys Be-Ge Mfg. Co.

Oliver Corp., Chicago, maker of farm equipment, purchased Be-Ge Mfg. Co., Gilroy, Calif., manufacturer of road building and construction equipment and some farm machines. Be-Ge will be operated by Oliver as a wholly owned subsidiary.

To Boost Sulphuric Acid Output

General Chemical Division, Allied Chemical & Dye Corp., New York, is enlarging the sulphuric production capacity of its Detroit Works in River Rouge, Mich. A major addition to the acid facilities of the plant was put into production in

Trailers Use Magnesium Ramp To Get "Piggyback" Ride

This portable magnesium ramp, developed by Magnesium Co. of America, East Chicago, Ind., in conjunction with Brandon Equipment Co., Chicago, facilitates transfer of trailers between highway and flat cars. The 45-ft long ramp is 9 ft wide, but flares to 11 ft at ground level. Weighing only 4800 lb, the ramp's capacity is designed to take the heaviest loaded trailer. Positioning requires two men

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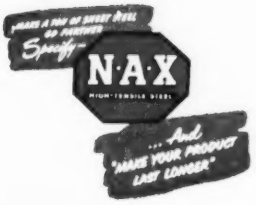
HIGH-TENSILE STEEL

N-A-X HIGH-TENSILE, having 50% greater strength than mild carbon steel, permits the use of thinner sections—resulting in lighter weight of products. It is a low-alloy steel—possessing much greater resistance to corrosion than mild carbon steel, with either painted or unpainted surfaces. Combined with this characteristic, it has high fatigue and toughness values at normal and sub-zero temperatures and the abrasion resistance of a medium high carbon steel—resulting in longer life of products.

N-A-X HIGH-TENSILE, with its higher physical properties, can be readily formed into the most difficult stamped shapes, and its response to welding, by any method, is excellent. Due to its inherently fine grain and higher hardness, it can be ground and polished to a high degree of lustre at lower cost than can mild carbon steel.

Your product can be made stronger . . . to last longer . . . and in some cases be manufactured more economically, when made of N-A-X HIGH-TENSILE steel.



GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division — Ecorse, Detroit 29, Michigan

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KEEP YOUR SCRAP MOVING TO YOUR DEALER

Will the product you plan to make...

.....need

an alloy so tough you may not yet have heard of it?

.....require

a forged finish like plate glass?

.....face

a man-made inferno?

You may even have a twist or two of your own to add to the problem the Jet Division helped solve for jet aircraft engine builders . . .

The "buckets" (paddles) on the turbine rotor at the rear of a jet engine whirl around about 10,000 times a minute, pulsed by a white-hot blowtorch of flame. To withstand this roaring inferno, the bucket surfaces and curves must be forged even smoother than glass. They must be made of an alloy tougher than the toughest steel. They must "take" this red-hot ride for hours without stretching out, or "creeping", from centrifugal force and heat.

The Jet Division makes more buckets for America's engine builders than any other manufacturer. We forge super-strength alloys into finished parts so smooth and accurate that they need no costly, lengthy finish-machining or polishing.

If your product or product-to-come must meet one of these conditions . . . two . . . three, or, even a brand new one, it can pay you to get in touch with us now.

JET DIVISION

Thompson Products, Inc.

CLEVELAND 17, OHIO

October. The new unit will nearly double the present sulphuric capacity of the plant.

Houdaille-Hershey Gets Order

Houdaille-Hershey Corp., Detroit, has been awarded a multi-million-dollar defense contract by the Navy. A large sum of money has been spent on machine tools for the classified order, and workmen now are tooling up the Buffalo plant for the job. Production will get under way at once.

Chrysler To Expand Plant

A $21-million expansion of Chrysler Corp. of Canada Ltd.'s Windsor, Ont., plant was announced by E. C. Row, president. This is in addition to the $20-million program announced by Mr. Row last February and now being completed. Most of the new program will consist of an addition to the present engine plant.

Cuno Names Representative

Cuno Engineering Corp., Meriden, Conn., appointed V. L. Towner Co. as its industrial sales representative in the Cleveland district.

Loth Stove Acquires New Line

Loth Stove Co., Waynesboro, Va., a division of Virginia Metalcrafters Inc., purchased all the patterns, flasks, dies, tools and fixtures of Rockwood Stove Co., Rockwood, Tenn.

Clothier Inc. Moves Branch

Van D. Clothier Inc., West Coast representative of Calumet & Hecla Inc.'s Wolverine Tube Division, Detroit, moved its northern California branch to larger quarters at 19 S. "B" St., San Mateo, Calif.

Carboloy To Build in Canada

Canadian General Electric Co. Ltd. has purchased a ten-acre industrial site in Toronto, Ont., for a cemented carbides plant with more than 40,000 sq ft of floor space. Erection will begin early in 1954 and the building will more than double facilities of the present Carboloy plant in Toronto.

Designed for big-tractor performance on small-acreage farms . . .

Sears Develops New Tractor for Part-Time Farmers

A NEW, unconventional riding tractor planned especially for farmers with working areas up to 30 acres will be introduced by Sears, Roebuck & Co., Chicago, in its spring general catalog and selected retail stores during January. This tractor is the latest in a series of equipment developed by the company especially for the growing class of part-time farmers.

This category includes over two million families who live on acreages from 3 to 30 acres. In few cases, it is pointed out, can a farmer with less than 50 acres justify investing $1000 or so on the smallest conventional riding tractor now on the market. At the same time, the highly successful garden or walking tractor is impractical for 3-acre or larger plots. Thus, so far as farming equipment goes, the part-time farmer has been largely neglected in the past.

Special Design—The new power unit is being introduced following five years of tests and a development cost of about $1.5 million. It is called the "Tri-Trac" because of its unique three-wheel construction—two small wheels in front and a larger drive wheel in the rear. Available at extra cost are 12 implements to accommodate all types of crop work — plowing, planting and cultivating — lawn mowing and snow removal.

Tractor has a 6.2-hp Wisconsin air-cooled engine. Engine-to-wheel speed ratio can be changed without use of the clutch through a variable-speed V-belt drive. Forward speed is from 2¼ to 4½ mph; reverse from 1¾ to 3½ mph. Also included in new mechanical features is the unique center swiveling action which permits all three wheels to steer, allowing a tight 8-ft turning radius. The front axle width adjusts from 48 to 72 in. by 2-in. intervals. Over-all length is 102 in., and maximum over-all width is 80 in.

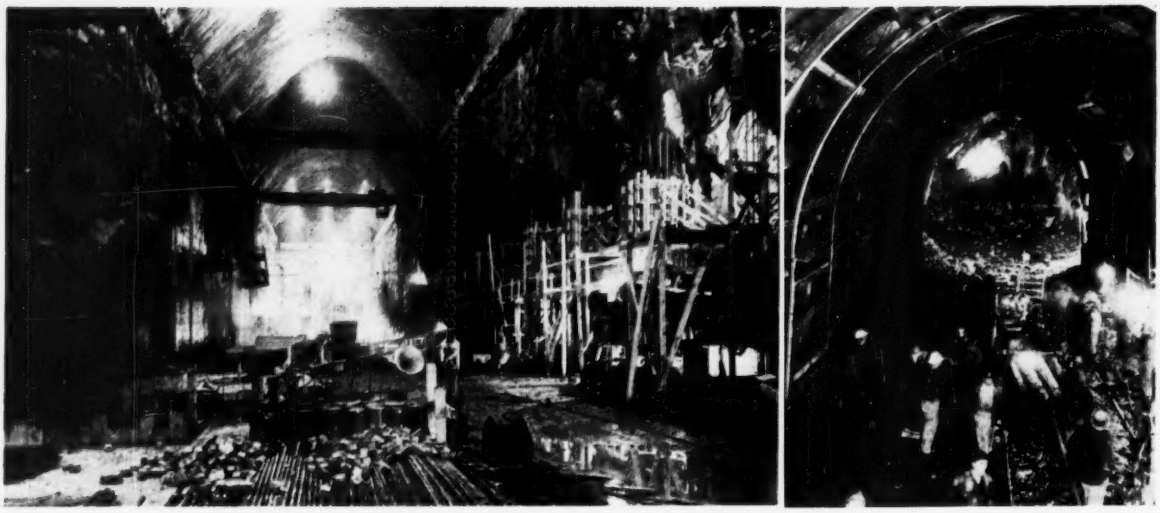
Design and manufacture are by David Bradley Mfg. Works, Bradley, Ill., wholly owned Sears subsidiary.

Dowty Equipment Opens Plant

Dowty Equipment of Canada Ltd. has begun operations in its new plant at Ajax, Ont. The firm now uses a total of 70,000 sq ft of floor space. It produces undercarriages and hydraulic equipment for the aircraft industry.

Columbia International Formed

Harry Kaplan and Jesse Weiss formed Columbia International Corp. with offices at 200 Terminal Rd., Clark, N. J. The firm offers trichlorethylene and other chlorinated solvents, a line of metal fin-



Underground Hydroelectric Power Station Taking Form Rapidly

Last face of rock in Aluminum Co. of Canada's water tunnel at Kemano, B. C., was "holed-through," above right, Dec. 3. The 10-mile long, 25-ft bore tunnel was completed in only 21 months. Soon water will plunge 2600 ft from the tunnel's end to a powerhouse which will generate electrical power for the firm's Kitimat smelter. Production of aluminum ingot is scheduled to start next summer. Above left is a general view taken from the service and control bay area

ishing equipment and supplies, industrial solvents and chemicals, fine chemicals and specialty intermediates.

Wollensak To Enlarge Plant

Wollensak Optical Co., Rochester, N. Y., will erect a $500,000 addition to its plant, adding 40,000 sq ft of floor space to manufacturing facilities. It is scheduled for completion July 1.

Engineering Firm Renamed

Mayline Co. Inc. is now the official name of the former Engineering Mfg. Co., Sheboygan, Wis. Drafting room furniture and equipment produced by the company has been indentified for several years with the tradename "Mayline."

Stanley Plans Denver Plant

Stanley Aviation Corp., Buffalo, will erect a $500,000 plant near Denver to which it will shift a large part of current production activities in Buffalo. The plant will go into operation next spring. Engineering and research departments will remain in Buffalo. The firm has begun to subcontract some of its work to other manufacturers in order to take care of a large volume of orders.

Ray Machine Building Plant

Ray Machine Co., Baltimore, specializing in small tools, is erecting a plant containing 2500 sq ft on Emaka avenue.

Harris-Seybold Buys Cottrell

Harris-Seybold Co., Cleveland, manufacturer of offset lithographic printing presses, acquired the assets of C. B. Cottrell & Sons Co., Westerly, R. I., builder of letterpress and gravure presses. The latter firm will be operated as a wholly owned subsidiary of Harris-Seybold, with D. C. Cottrell continuing as president.

Westinghouse Appoints Agent

Westinghouse Electric Corp., Pittsburgh, appointed B. L. Robinson & Co., Burlington, Iowa, as one of its full-line apparatus distributors.

Equipmentmaker Names Agents

Rodney Hunt Machine Co., Orange, Mass., appointed W. C. Davis & Associates, Atlanta, as agents for its Process Equipment Division. Products to be handled include evaporators, spray dryers and other stainless steel processing equipment. Rodney Hunt also makes equipment for the textile wet-finishing industry and water control field, in addition to industrial rolls and water turbine units.

Waco Mfg. Opens Branch

Waco Mfg. Co., Minneapolis, manufacturer of steel scaffolding and shoring equipment, completed a branch office and factory on W. 130th street, Cleveland.

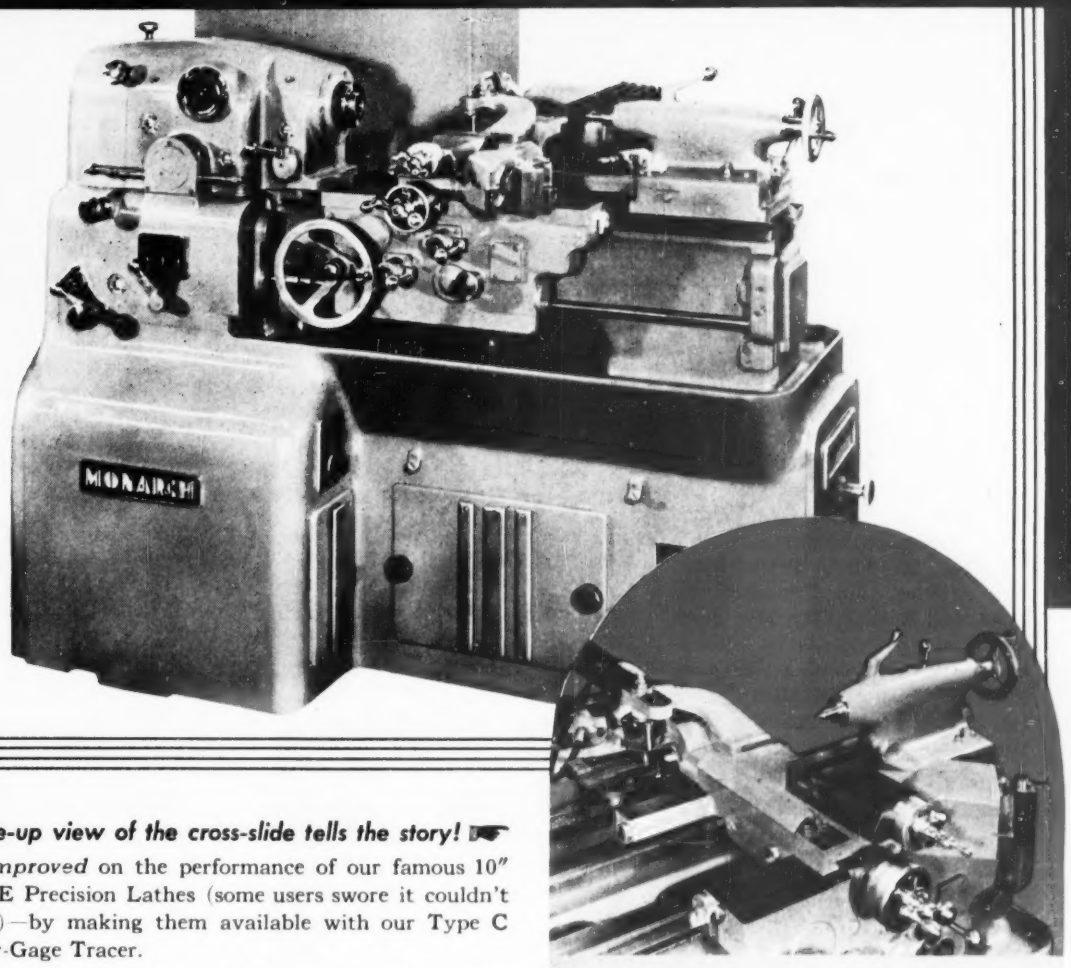
Canadian Subsidiary Formed

Manning, Maxwell & Moore Inc., Stratford, Conn., formed a subsidiary, Manning, Maxwell & Moore of Canada Ltd., Galt, Ont. The new company will commence manufacture of gages, cranes, locomotive equipment, etc., early in 1954.

Curtis Lighting Expanding

Curtis Lighting of Canada Ltd., Toronto, Ont., has concluded agreements with Miller Co., Meriden, Conn., and Revere Electric Mfg. Co., Chicago, to produce and sell products of these firms in Canada. Initial manufacturing plans will include the Miller line of industrial and commercial illuminating fixtures and a wide range of Revere outdoor lighting equipment. Curtis will erect a factory addition of 15,000 sq ft.

Can you spot the brand new touch in this Production Masterpiece?



The close-up view of the cross-slide tells the story! ☛

We've *improved* on the performance of our famous 10″ Model EE Precision Lathes (some users swore it couldn't be done!)—by making them available with our Type C Rigid Air-Gage Tracer.

This more compact, more rigid design not only permits an ever higher quality standard, but increases the range by allowing a generous 3″ maximum diameter change at a single setting. Conversion can be made within seconds to manual control for the usual turning, boring and facing operations.

The Air-Gage Tracer is widely acknowledged as the most accurate duplicating device yet developed—and can be applied to either the 10″ Model EE Sensitive Precision Toolmaker's Lathe or to the 10″ Model EE Precision Manufacturing Lathe (above). Both of these lathes, with over 6000 in use, have fully earned their designations. To this combination, add such refinements as the vibration-dampening Monarch Electronic Drive—and you get a turning instrument unequalled for precision, speed and sensitivity. Write now for our new Booklet No. 2607, featuring many job reports . . . *The Monarch Machine Tool Company, Sidney, Ohio.*

MONARCH TYPE C RIGID AIR-GAGE TRACER DETAIL

Note that the tool, mounted not on the hydraulic slide but on its own slide, can be adjusted for diameter changes without altering template or tracer setup.

Monarch

ACCURACY • ECONOMY • LONG LIFE

TURNING MACHINES

FOR A GOOD TURN FASTER . . . TURN TO MONARCH

New Warehouse Formed

Dumas-Caine Steel Co. will serve South through facilities in Atlanta and Marietta, Ga.

DUMAS-CAINE STEEL CO. has been organized to render steel warehousing services to the southeastern and southwestern markets. The new company, formed by Dumas Steel Corp., Pittsburgh, and Caine Steel Co., Chicago, will maintain a sales office and warehouse at Marietta, Ga., with J. W. Clouser as manager.

Based on confidence in the continued industrial expansion of the South, Dumas-Caine Steel is constructing a sales and steel warehouse containing 30,000 sq ft of floor space at Atlanta to be completed about Feb. 1. This warehouse will carry a complete line of flat-rolled steel products, as well as bar shapes. It will be equipped for shearing and slitting sheets and coils.

Dumas Steel Corp. operates offices and warehouses at Carnegie, Pa., Chicago and New York. Caine Steel Co. operates warehouses in Chicago, St. Paul, Philadelphia, Los Angeles, San Francisco, St. Louis and Kansas City, Mo. Sales offices are maintained in Milwaukee; Dallas; Indianapolis; Elkhart, Ind.; Grand Rapids, Mich.; Bristol, Kingsport and Johnson City, Tenn.

Crouse-Hinds Expands Foundry

New nonferrous foundry facilities will be ready for use soon at Crouse-Hinds Co.'s plant in Syracuse, N. Y. The new plant contains 49,000 sq ft of floor space. Increased mechanization is being achieved in the new foundry, which will have larger melting furnaces.

Plans Building for Ford Unit

Ford Motor Co., Dearborn, Mich., will erect a building for its Special Product Division in Ecorse, Mich. It will house executive and administrative offices and manufacturing facilities. It is scheduled to be completed in the spring of 1955. The division has been working in a number of research areas related to new automotive products and plans to have manufacturing facilities and a sales organization established by the time a new car is ready. The division reports to J. R. Davis, vice president and group executive.

Reinartz Heads Institute

Leo F. Reinartz, vice president of Armco Steel Co., Middletown, O., will serve as president of American Institute of Mining & Metallurgical Engineers Inc., New York, in 1954.

Fansteel Renames Subsidiary

Fansteel Metallurgical Corp., North Chicago, Ill., changed the name of Weiger Weed & Co., Detroit, a wholly owned subsidiary, to WW Alloys Inc. The division produces spot welding electrodes, seam welding wheels, water-cooled holders and other products for resistance welding. The division is expanding into the production of copper-base alloys for other applications.

Delta Steel Opens Branch

Delta Steel Buildings Co., Dallas, opened a branch office at 201 S. Adams St., Ft. Worth, Tex. The company represents Metallic Building Co., Houston, manufacturer of prefabricated steel buildings.

Stainless Steel Cone

This unit forms part of an unusual furnace cone assembly. The cone and tip are of alloy type 25-12 heat-resistant stainless steel, cast by Cooper Alloy Foundry Co., Hillside, N. J. Weight of tip alone is about 750 lb

Warehousing Firm Organized

Incalite Corp., Carrollton, Tex., a newly formed steel jobbing company has completed construction of its warehouse. Stocks include hot and cold-rolled sheets, flat galvanized sheets and other steel products. Shearing facilities are available.

Utica Drop Forge Expands

Utica Drop Forge & Tool Corp., Utica, N. Y., has signed a five-year lease to take over about 40,000 sq ft of space in a plant in New York Mills, N. Y. The firm will move some of its metallurgical, research and development departments from Clayville, N. Y. Dr. F. M. Darmara is in charge of the departments to be concentrated in the new location.

A. O. Smith Buys Glascote

A. O. Smith Corp., Milwaukee, purchased Glascote Products Inc., Cleveland, and will operate the property as a subsidiary. L. T. Hickey has been named a vice president and general manager of Glascote. The Cleveland firm makes a variety of small glass-coated tanks and vessels, glass-coated pipe and pipe fittings, as well as some steel and alloy products.

Dexion To Build in Canada

Dexion Ltd. will erect a factory building in Toronto, Ont. The firm is affiliated with Dexion Ltd., London, England. Scheduled for completion in January, the plant will turn out slotted angles of aluminum and steel, used in the production of work benches, storage racks and building frames. Dugald Cameron will be managing director of the new company.

Esso Enlarges Facilities

Esso Standard Oil Co., New York, has started work in Baltimore on a new bulk plant operation which will be completed late in 1954. The plant will be located near Dundalk avenue and Gusryan street, adjacent to its Canton refinery. New facilities will include more than 20 storage tanks, an office and warehouse. C. A.

Aircraft engine heat deflector

...ON THE FARM

Cream separator bowl base

...stainless castings cut costs

Considerable savings in both material and machining time are effected when Crucible Stainless Steel Sand Castings are used. And here are two good examples.

The heat deflector — which protects vital turbine assembly parts in an advanced model aircraft engine — was cast by Crucible from AMS-5363A (Type 347) stainless . . . in conformance with rigid aircraft quality standards. Previously this part had been completely machined from a solid forging. The cast part performs the same job, but at a substantial saving in manufacturing cost.

The bowl base for a dairy cream separator was cast by Crucible from CF-20 (Type 302) stainless. To permit fast and efficient finishing in automatic machine tools, the casting must be held to close tolerances. Also, it has to be free from porosity, shrinkage, gas holes, inclusions or any defects that in the finished part would interfere with cleanliness or violate food laws.

Both the heat deflector and the bowl base applications exemplify how steel and machining time may be saved by using a stainless steel casting instead of machining from bar stock or a forging. If you make a product that must resist corrosion, consult Crucible regarding the advantages of producing it from a stainless sand casting.

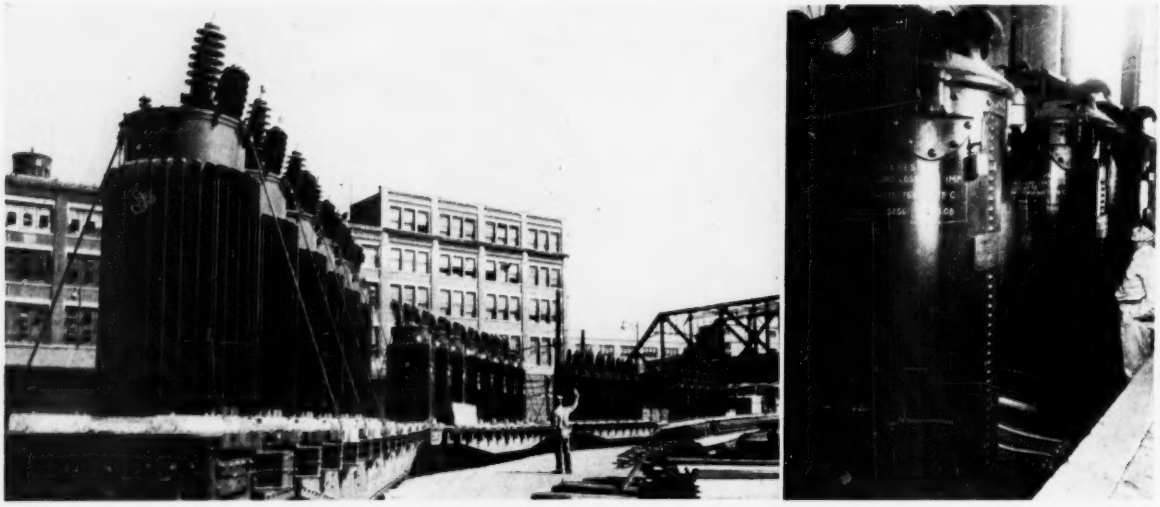
CRUCIBLE first name in special purpose steels

53 years of *Fine* steelmaking

STAINLESS CASTINGS

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

STAINLESS • REX HIGH SPEED • TOOL • ALLOY • MACHINERY • SPECIAL PURPOSE STEELS



1953 Model Transformers To Join 1903 Relics in Nation's Power System

Shipment of 27 transformers, above left, comprised the biggest shipment of identically rated units ever sent to one customer in one day from General Electric Co.'s plant in Pittsfield, Mass. They contrast sharply in appearance with transformers manufactured by the firm in 1903, shown at the right. The three cast iron relics are still in service

Newland is division manager, with offices in the Standard Oil Building, St. Paul place and Franklin street.

Jackson Re-elected AISC Head

John E. Jackson, president, Pittsburgh-Des Moines Steel Co., Pittsburgh, was re-elected president of American Institute of Steel Construction, New York. Other officers, all of whom also were re-elected, are: Earle V. Grover, Apex Steel Corp. Ltd., Los Angeles, first vice president; N. P. Hayes, Carolina Steel & Iron Co., Greensboro, N. C., second vice president; James M. Straub, Ft. Pitt Bridge Works, Pittsburgh, treasurer; M. Harvey Smedley, secretary; and L. Abbett Post, executive vice president.

Telecomputing To Build Plant

Telecomputing Corp., Los Angeles, will construct a 25,000-sq-ft plant on Saticoy street for production of computing equipment.

Lapp Building Laboratory

Lapp Insulator Co., Le Roy, N. Y., is constructing a high voltage laboratory. When completed next June, it will replace the company's present laboratory. The new facility will be able to produce 1 million volts at 60 cycles, says R. L. Jenner, president.

Wilcolator Ltd. Organized

Wilcolator Ltd., Toronto, has begun operations in a new factory. The firm is a recently formed subsidiary of Wilcolator Co., Elizabeth, N. J., producer of temperature controlling mechanisms. The Canadian company will make specialized thermostatic devices.

Ford Opens Service Laboratory

Ford Division, Ford Motor Co., Dearborn, Mich., formally opened its technical service laboratory in Livonia, Mich. It is designed to develop procedures and materials for servicing and maintenance of Ford cars and trucks. Carl T. Doman is national service manager while L. D. Crusoe is general manager of Ford Division.

Broadens Grinding Service

Establishment of a custom grinding service for industry has been announced by Majac Engineering Co., Blawnox, Pa. Designed for pilot work for large volume and for processors whose volume does not warrant installation of large commercial pulverizing equipment, the service includes complete laboratory and testing functions, if necessary, prior to volume production. Two jet pulverizers of the concern's own manufacture are used, with a capacity of 4000 lb of material per hour.

Wiard To Resume Operations

Wiard Plow Co. Inc., Batavia, N. Y., where production has been at a virtual standstill since last July, will launch a remodeling and expansion program. Manufacture of farm implements will be resumed early next year.

Joyce Cridland Expanding

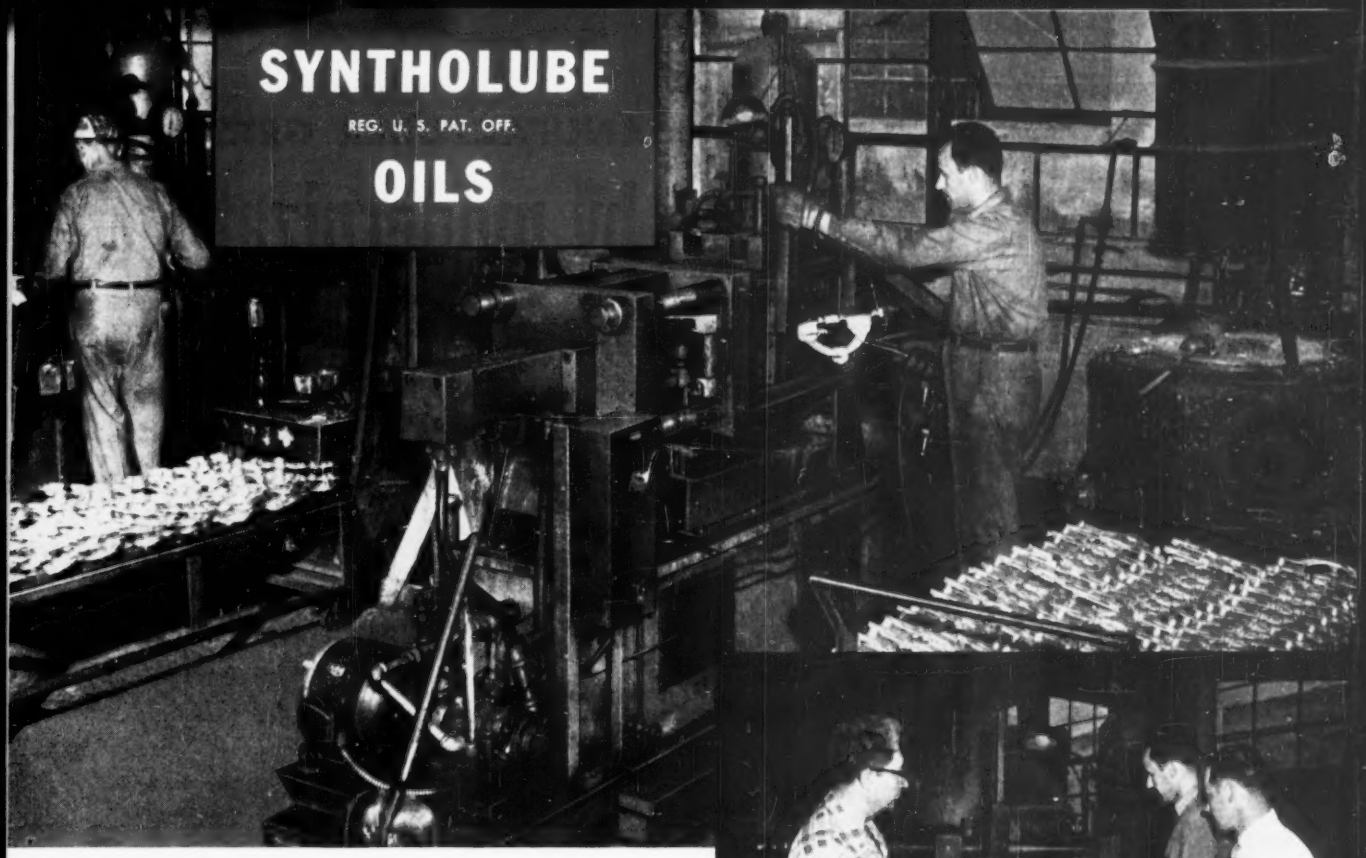
Joyce Cridland Co., Dayton, O., is erecting a plant addition which will boost its production capacity. The project will cost about $215,000. The firm makes jacks and materials handling equipment.

Carboloy Agency Changes Hands

Controlling interest in Terry Sales Corp., Maumee, O., sales and service representative for Carboloy permanent magnets, was purchased by Herman D. Kreiger, Toledo, O. Officers of Terry Sales Corp. are Mr. Kreiger, president and treasurer; W. E. Terhell, vice president; Leone Bennett, secretary.

American Latex Building

American Latex Products Corp., Hawthorne, Calif., is constructing a 30,000-sq-ft plant for production of foam rubber, industrial adhesives and rubber by-products.



Mr. Simon Slutsky (left), co-owner of Atlantic Die Casting Company, and Mr. L. J. Loomis (extreme right), Standard's lubrication specialist, watch machine operator use the somewhat unique spray method devised to apply SYNTHOLUBE Oil to hot and hard-to-lubricate parts of die casting machine.

Beats heat in die casting machines . . .

● The Atlantic Die Casting Company specializes in aluminum die casting. Using hydraulic machines of its own design, this company turns out amazingly intricate parts at a high rate of production. But it was not always easy going.

There had been a problem of lubrication. The exceedingly high temperatures necessary for die casting made it difficult to lubricate machine parts in the area of the heated dies. Various expensive and complicated lubricating mixtures were tried. Under the high temperatures, the lubricants thinned and did not cling well to the hot surfaces. Oxidation of the lubricants produced deposits. Resulting troubles: sticking of machine parts, particularly ejector pins; staining of aluminum castings, down-time for cleaning.

Consulted on this problem, a Standard Oil lubrication specialist recommended the lubricant that had been developed by Standard Oil for just such high temperature applications: SYNTHOLUBE Oil.

This unique product has made short work of the lubrication troubles. It does not "run" from hot surfaces. Its unusual depolymerizing characteristic has prevented the formation of troublesome deposits. In addition to other lubricating benefits, SYNTHOLUBE has eliminated the expense of using costly lubricating mixtures.

Whatever your lubricating problem or need, you'll find that a Standard Oil lubrication specialist has the engineering ability and the petroleum product to help you. You can reach the specialist serving your area of the Midwest by phoning your local Standard Oil office. Or, write: Standard Oil Company, 910 So. Michigan Ave., Chicago 80, Ill.

STANDARD OIL COMPANY STANDARD *(Indiana)*

LEADING VALVE MANUFACTURER GETS

49% time savings by modernization!

Take a look at the tremendous time savings delivered by

WARNER & SWASEY TURRET LATHES

at the Lunkenheimer Company Cincinnati, Ohio

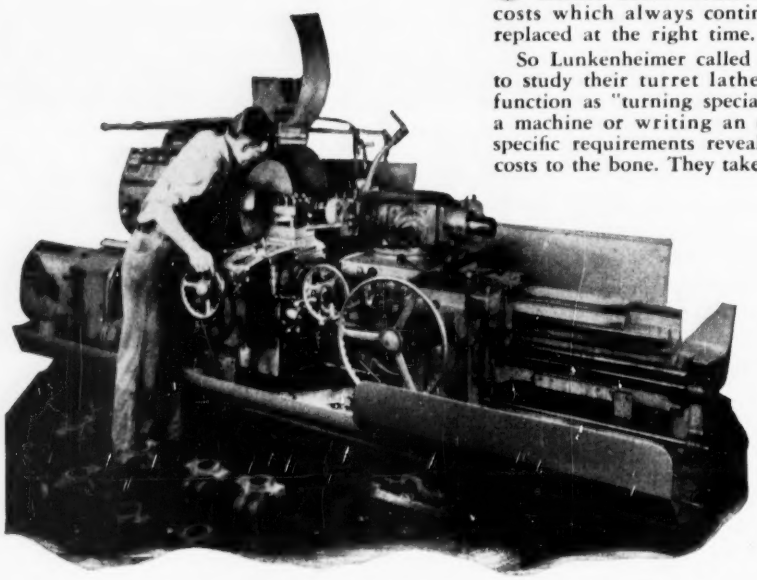
Warner & Swasey TURRET LATHE	OPERATION	TIME SAVED
No. 2 or 3 Universal	Cut and Burr Yoke Bushings	66%
	Cut and Burr Gage Valve Yoke Bushing	74%
No. 3 Universal	Turn, Face and Chase body end of Seat Rings	41%
No. 4 Universal	Cut Yoke Bushings end of Valve Body	48%
	Cut and Tap for Seat Ring, Turn and Face Yoke Flange	43%
No. 5 Universal	Cut and Face for Bottom Plug of Valve Body	55%
	Finish both Welding Ends of Valve Body	40%
2-A Heavy Duty	Turn, Bore, and Face Gate Valve Seat Ring	42%
	Bore, Finish Tongue and Cut off Disc Rings	34%
3-A Heavy Duty	Bore and Face Handwheels	65%
4-A Heavy Duty	Cut and Tap stem end of Gate Valve Disc	31%
AVERAGE TIME SAVED		**49%**

ONE IMPORTANT PHASE of the Lunkenheimer Company's multi-million dollar modernization program was eliminating those costs which always continue to mount when equipment is not replaced at the right time.

So Lunkenheimer called in Warner & Swasey Field Engineers to study their turret lathe situation. These men (who actually function as "turning specialists") don't believe in recommending a machine or writing an order until their detailed analysis of specific requirements reveals just which type and size will cut costs to the bone. They take pride in seeing new machines pay off fast, as they did at Lunkenheimer.

Time savings here ranged from 31% to 74%!

For machining advice you, too, can confidently regard your nearest Warner & Swasey Field Engineer as a "turning specialist". He not only offers you the most complete line of turret lathes to increase production at less cost but, equally important, he knows how to intelligently tackle your replacement problems.



Warner & Swasey 3-A Saddle Type Heavy Duty Turret Lathe machining a valve bonnet at the Lunkenheimer Company, Cincinnati, Ohio.

WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

STEEL

December 28, 1953

Technical Outlook

GETTING TOUGHER— Manufacturing trends constantly increase machining requirements. Airplane designed for a gross load of 75,000 pounds a few years ago has upped its load-carrying capacity to 140,000 pounds. Parts formerly in the 150,000 psi range have jumped to 240,000 psi. Experiments are in progress to machine steel alloys rated at 300,000 psi.

TITANIUM— Perennial drive to take pounds off aircraft has been given a boost by titanium-alloy locknuts. Less than half as heavy as steel hex nuts, they meet AN tensile strength specs for steel nuts of same thread size. The producer, Elastic Stop Nut Corp. of America, Union, N. J., says a permanent coating cuts seizing and galling to a minimum.

PRESSURE OFF— Metallurgists are finding that they must pay more attention to control of unusual properties in metal parts. Example: Electrical conductivity. Difficulty here is a nondestructive method for measuring conductivity. Ampco Metal laboratories find that a recent German-made conductivity tester handles this problem with a calibrated electronic unit. Spot contact reads per-cent electrical conductivity directly.

THERMOMETERS— Paint that indicates temperature by changing color is being developed by the Navy to measure extreme heat generated by jet engines and guided missiles. Range so far is 122 to 532.4° F.

SLURRY DEBURRING— Machine rotates parts held in chucks (about 8 rpm) in a revolving tank that holds abrasive slurry. Machines are made with from 4 to 14 spindles that index through 360 degrees. As each spindle approaches the unloading position, it automatically rises; part and spindle are water flushed to remove slurry. Tank rotates at what amounts to about 400 sfm in a direction opposite to index of the spindles. By co-ordinating the controls, selected areas of parts can be deburred or radiused to a greater degree than the balance of the part. Selection of materials in the slurry will place emphasis either on the finishing with respect to color or the microinch surface improvement of the metal.

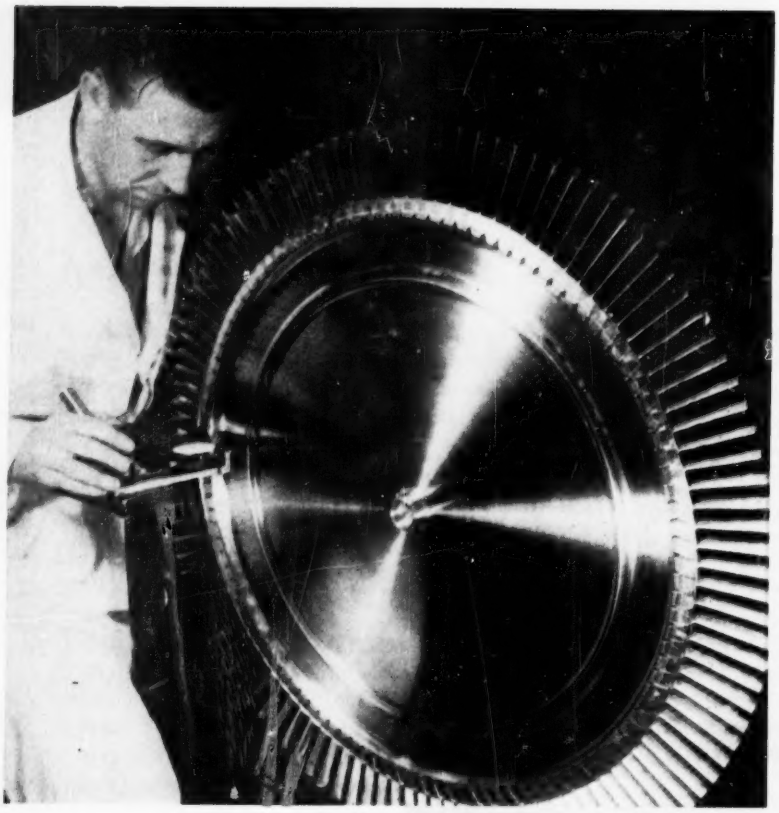
NON-SLIP HAMMERS— Vacuum grip on hammers and other tools offers safety plus comfort, says Ampco Metal Inc., Milwaukee. Callouses are formed when solid tool handles drive blood from skin surfaces. Perforated, vacuum grip reduces the compression area, permitting more blood to stay where it should.

NONFERROUS NOTE— Production of 99.99 per cent pure aluminum is getting a lot of attention here and abroad. Holding the promise of a permanent, lustrous finish that stands up even in salt water, it is receiving serious consideration for jewelery and trim for autos and appliances.

HOW ARE YOU FIXED FOR BLADES? To test for decarb, just heat a razor blade in the molten bath, then water quench it. If blade snaps, bath is nondecarburizing. If it bends, bath is decarburizing and needs rectification.

SULPHUR— On the top consideration list of the Bureau of Mines this year is the development of a method for putting sulphur in steel to produce controlled machining quality. Using the experimental open-hearth furnace at the Pittsburgh experiment station, bureau is attempting to inject jets of sulphur and other alloying elements into the molten steel bath.

Metalworking Outlook—p. 19 *Market Outlook—p. 93*



By DR. ALLEN G. GRAY
Technical Editor

Timken metallurgists reduced nickel content of their tried and proved 16-25-6 alloy 40 per cent. High temperature properties are good as ever; ductility is even better than ever

New Alloy...

BOOST TO TURBINES

RELIEF FOR STOCKPILE

NOT ALL gas turbines are large. Small ones are used to power all kinds of equipment—much of it top secret. It's a good bet within five years we'll see a gas turbine engine for autos.

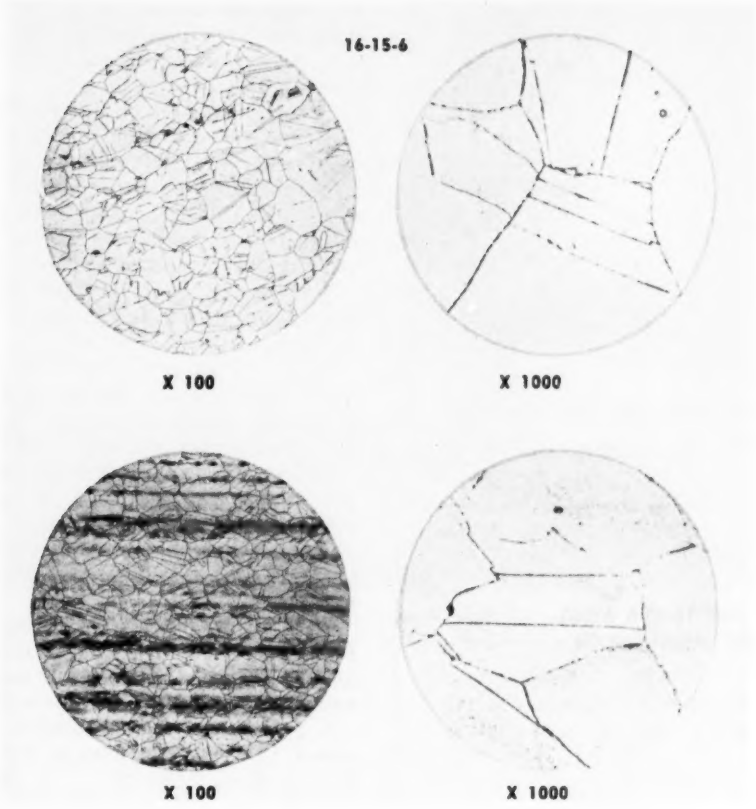
Key to progress in gas turbine development is suitable metals for the turbine wheel itself. Extreme heat and terrific stresses cause wheels of ordinary materials to lose their strength. They may even fly apart and wreck the turbine.

Help — One developer of small gas turbines, Boeing Airplane Co., in search of a wheel material that would stand up under high speeds and red-hot temperatures, turned to metallurgists at Timken Roller Bearing Co. for help. Answer they gave: "16-25-6," a superalloy steel developed by them. It's widely used in airplane superchargers, jet engines and large stationary gas turbines.

The "16-25-6" composition was introduced about 12 years ago. Since that time, more than 40 million pounds of billet stock have been shipped from Timken's mill.

Takes a Lot—While the "16-25-6" alloy has a pretty low strategic alloy number (it does not contain elements like columbium, cobalt or tungsten), it does ring the bell on nickel. It uses 25 per cent to assure a fully austenitic microstructure—required for best high temperature strength in ferrous alloys.

Then Timken metallurgists started thinking about 25 per cent



Solution quenched, elongated 15 per cent by cold work. Top: Tempered for 4 hours at 1300° F, BHN, 220. Bottom: 15 hours at 1300° F, BHN, 237

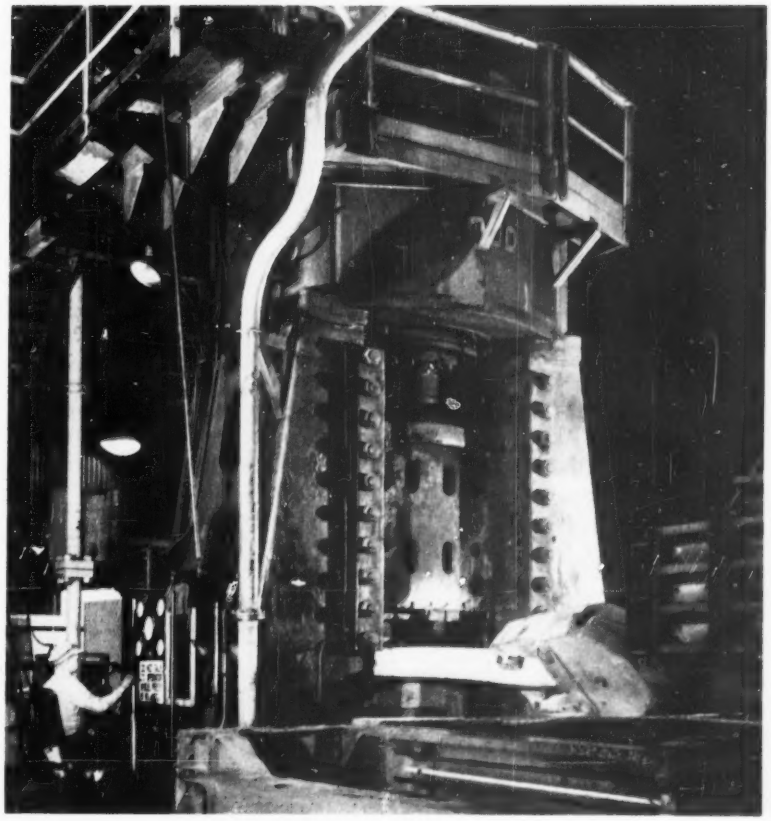
Big 3000-ton hydraulic press used at Timken to forge 16-15-6 steel

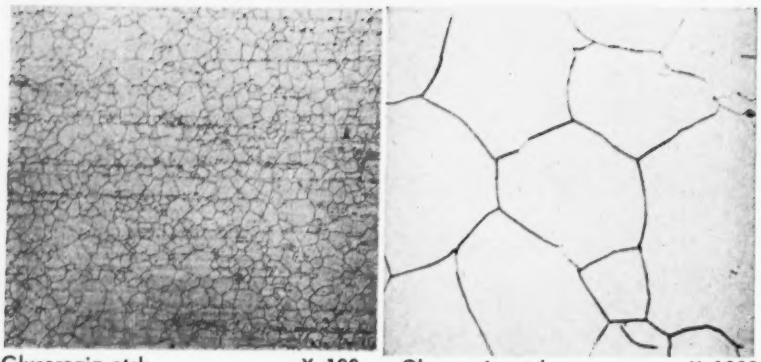
nickel . . . what it could mean in a national emergency when military hardware for jet engines would be required in unprecedented volume . . . also, a successful gas turbine auto engine would pyramid amounts of high temperature alloys needed.

Perhaps, they figured, the alloy content of "16-25-6" could be lowered without sacrificing properties that had made it so useful. Experienced Martin Fleischmann and other researchers at Timken decided it was worth a try.

Genesis — First they examined steps that led to development of the 16-25-6 alloy. Chromium content of about 16 per cent is needed to maintain required corrosion and oxidation resistance at high temperature service conditions. Use of 6 per cent molybdenum still offered the best approach for necessary high temperature strength.

Alloy should have low carbon content to insure good forging and welding characteristics. Another key point: It should be fully austenitic. Nickel in amount of 25





Glyceregia etch X 100 Glyceregia etch X 1000

Hot rolled, heated to 2100°F for 10 minutes and water quenched, BHN 186

CHEMICAL SPECIFICATION FOR 16-25-6 ALLOY COMPARED WITH ITS NEW MODIFICATION

	C	Mn	Si	Cr	Ni	Mo	N
16-25-6	0.12 Max	2.0 Max	1.0 Max	15.0-17.5	24.0-27.0	5.5-7.0	0.10-0.20
16-15-6	0.08 Max	6.5-8.5	1.0 Max	15.0-17.5	14.0-17.0	5.5-7.0	0.15-0.25

STRESS-RUPTURE PROPERTIES FOR 16-25-6 COMPARED WITH 16-15-6 ALLOY AT IDENTICAL STRESS LEVELS

CONDITION: SOLUTION QUENCHED FROM 2150° F

Material Type	Temp. °F	Stress PSI	Time to Fracture Hours	Elong. %	Red. %
16-25-6	1100	50,000	226	9.0	16.7
16-15-6	1100	50,000	549	13.5	15.0
16-25-6	1300	25,000	263	16.0	18.9
16-15-6	1300	25,000	377	81.5	68.3
16-25-6	1400	20,000	106	15.5	24.1
16-15-6	1400	20,000	92	63.0	62.5

CREEP RATES OF 16-15-6 ALLOY SOLUTION QUENCHED FROM 2150°F

Temp. °F	Stress PSI	Creep Rate (% Per 1000 Hours) 500	1000	1500	2000	2500	3000 Hours
1200	25,000	2.02	1.04	.87	.84	1.34	2.60
1200	20,000	.71	.36	.21			
1300	15,000	1.09	.45	.43	.49	.68	1.14
1300	12,500	.50	.22	.13	.11		
1400	7,250	.17	.26	.38	.58	—	—
1400	5,000	.15	.11	.11	.11		

per cent was needed to balance chromium and molybdenum contents to arrive at the fully austenitic condition.

Clue—How did the picture look? The researchers decided that any alloy savings would have to be made by lowering nickel content. What could substitute? One logical candidate was manganese, since it, like nickel, makes alloys austenitic.

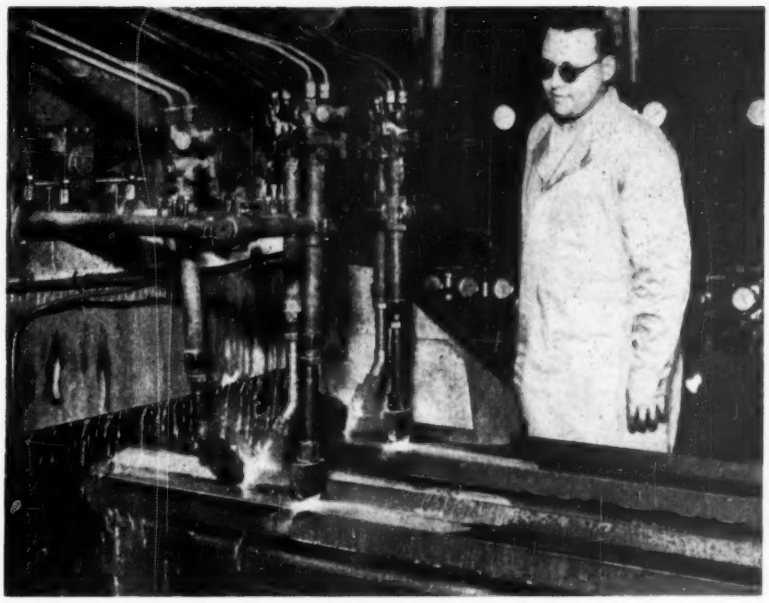
By reducing nickel content, it was possible to increase amount of nitrogen that could be added to the alloy. High nickel content reduces solubility of nitrogen in steel, while manganese enhances it. The metallurgists working on the problem remembered that nitrogen has a beneficial effect on creep strength; and also is a good stabilizer in its own right for austenite during primary crystallization.

Here It Is—Chemical specification for the new high temperature 16-15-6 alloy is: Carbon, 0.08 per cent max; manganese, 6.5-8.5; silicon, 1.0 max; chromium, 15.0-17.5; nickel, 14.0-17.0; molybdenum, 5.5-7.0; nitrogen, 0.15-0.25.

Compared with the previous 16-25-6 alloy, silicon, chromium and molybdenum are the same. Manganese is upped from 2 per cent to range 6.5-8.5; nickel is lowered about 40 per cent, from range of 24-27 to 14-17 per cent. Carbon is slightly lower in the new alloy at 0.08 max. rather than the 0.12 max. spec for 16-25-6. Nitrogen comes into the picture too. It is increased to 0.15-0.25 from a range of 0.10-0.20.

Bonus — High ductility values shown at elevated temperature tests suggested that the 16-15-6 alloy was notch-ductile. This point was confirmed on bar stock and a turbine wheel rim forging from which notch-rupture tests were obtained. Test forging was produced from 16-15-6 material, using the production method specified for the 16-25-6 alloy—warm working to a 269-321 Brinell range.

Results were the answer to the researcher's dream. High temperature strength of 16-15-6 was equal to 16-25-6 in the solution quenched condition. Also, they gained a point they hadn't bargained for: Ductility of the new alloy was even better than the old standby.



Machine bed ways are flame hardened. These castings, like others, demand high quality for end-use success

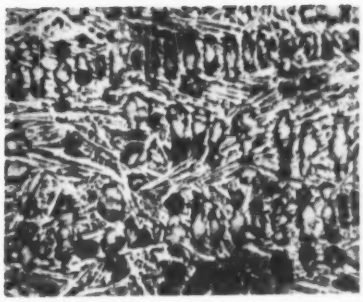


Fig. 1 X 400

By JOHN OBREBSKI
Metallurgist
Monarch Machine Tool Co.
Sidney, O.

Inside Look AT HARDENING CAST IRON

Hardenability of cast iron depends on the analysis, structure, and as-cast hardness plus the stability of pearlite. For high quality, watch these and the heat-treat process

PERFECT CAST IRON may be hardened like steel and ground to a smooth finish like steel. At the same time, high hardness and good wear resistance are accompanied by excellent dampening ability.

Hardened pearlitic matrix of a high quality cast iron has a hardness of about Rockwell 60 to 62C. However, hardness of the graphite is practically zero and thus average hardness cannot be so high. Still a hardness of Rc 50 and even 53 is obtainable.

Deceptive Item — Structure of cast iron does not depend on its composition alone. Analysis, however, is an important factor even though a poor cast iron and a high quality cast iron may have exactly the same chemical composition.

Separately-cast test bars may be better than the casting itself although they were poured from the same heat. Final structure depends on physical properties of the liquid metal, but it also depends on solidification conditions.

Test Bars—These solidification conditions should be accounted for in any attempt at casting-quality control. Many castings, such as those for machine tools, rely on high quality for end-use success. To determine the quality of our castings at Monarch, we have a small sample cast with every lathe bed undergoing inspection.

Sample is then cut off the lathe bed and examined carefully before the latter is released for further operations, such as planing, flame hardening and grinding.

This individual examination consists of: Measuring hardness of the as-cast sample, measuring hardness of a hardened sample, measuring hardness of slow cooled samples—from 1550°F, examination of structure under a microscope and chemical analysis.

Machinability and surface con-

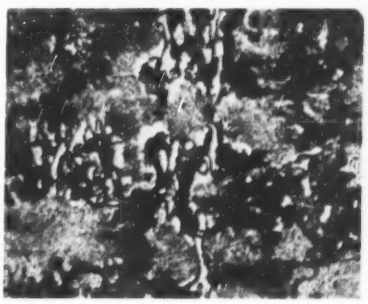


Fig. 5 X 200

Fig. 2 X 400

Fig. 3 X 400

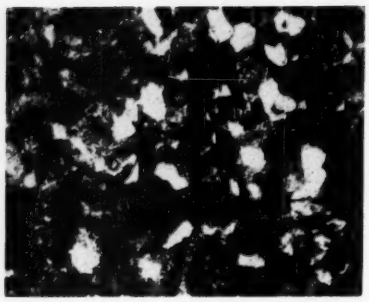


Fig. 4 X 200

dition are examined on all beds when planed; hardness and surface condition when flame hardened; and surface condition when ground. The samples taken from the beds themselves provide a true picture of what occurred during solidification.

Two Views—As stated above, structure of a given cast iron depends on many factors, among them the solidification conditions. Bar having a pearlitic matrix and random uniform graphite was heated to the melting temperature, then quenched with a water douche. Sample cut off this bar showed a thin layer (Fig. 1) of white cast iron, followed by a second layer (Fig. 2) of gray cast iron with typical eutectic graphite. Matrix consists of austenite and martensite. Eutectic graphite did not exist before, but appeared only because of different solidification conditions.

Fine eutectic graphite often appears as a graphite-ferrite eutectic, (Fig. 3). However, eutectic graphite on the background of pure pearlite may be found in many heats of gray cast iron.

Not Always—It often has been said that rapid solidification leads to structure of a white cast iron. However, that isn't always the case. If the silicon content is sufficiently high, rapid solidification causes a ferrite graphite structure. Slower solidification, however, causes pearlite and ferrite and eutectic graphite solidification.

Figs. 4 and 5 show structures of two castings, poured of practically the same cast iron. One casting (Fig. 4) shows some free ferrite in its structure, while the other (Fig. 5) has some primary cementite.

Two Faced—Different structures may be found in the same casting and even in a small sample cut from it. Flame hardening changes the structure of cast iron—transforming pearlite and ferrite (if any of the latter is present) into martensite. Primary cementite remains undissolved.

Common assumption is that the highest hardness is obtained when pure pearlitic cast iron is hardened. This is not the case. Some pure pearlitic cast irons gave a hardness of about Rc 43 to 45 when hardened. At the same time one cast iron with some free ferrite and another with some primary cementite may have a hardness of Rc 52 to 53. The structure (Fig. 6) was fine grain martensite with cementite unchanged.

Part True—As-cast hardness of the cast iron that we use for flame hardening is about Brinell 190 to 230. Samples with a hardness of BHN 190, may, when furnace hardened, have a hardness of Rc 50 as well as Rc 42. Samples with a hardness of BHN 212 to 217, may, when furnace hardened, have a hardness of Rc 53 as well as Rockwell C 43.

Assumption that a higher as-cast hardness results in a higher as-quenched hardness is true only in 60 to 70 per cent of the cases. If the as-cast microstructure is extremely favorable and the as-cast hardness not less than BHN 200, hardness of quenched samples and of the flame-hardened castings may be predicted as Rc 49 to 52. Even then the judgment will be true for only about 80 to 85 per cent of the cases.

Observations — Since many

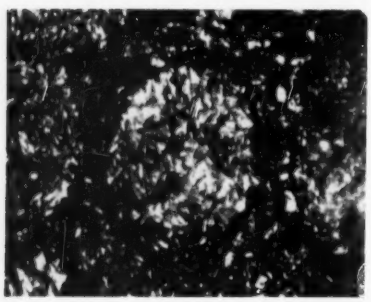


Fig. 6 X 400

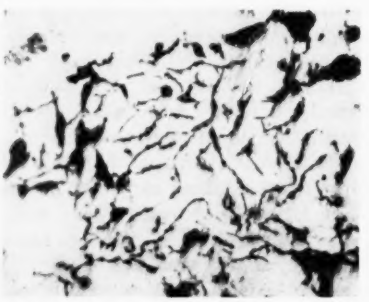


Fig. 7 X 200

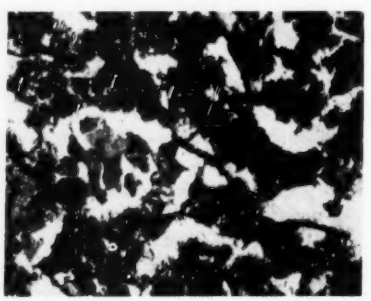


Fig. 8 X 200

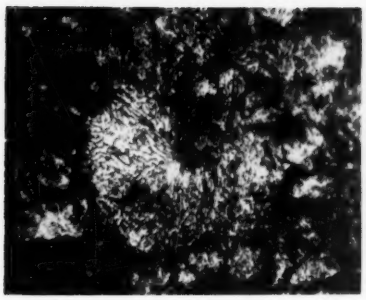


Fig. 9 X 200

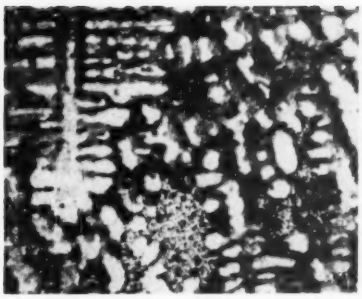


Fig. 10 X 50

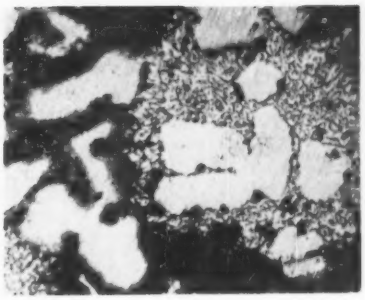


Fig. 11 X 200

samples are examined in our program, some unusual facts have been observed. Some heats of cast iron lose hardenability when heated, especially when heating time is comparatively long.

Samples having about the same analysis and about the same as-cast hardness, were heated to a temperature of 1550° F and slowly cooled. Pure pearlitic structure, fully or partially disappeared. Pearlitic cast iron was transformed into a mixed pearlite-ferrite or even into a ferritic cast iron. Change of structure is shown in Figs. 7 (pearlite about decomposed) and 8 (pearlite partially decomposed), while Fig. 9 shows the as-cast structure.

Influences — Decomposition of pearlite, complete or partial, may be readily explained. Iron carbides in the pearlite decompose into ferrite and graphite. This decomposition is promoted by so-called graphitizers. Graphitizers are: Carbon (if very high), silicon, copper, nickel and others. On the contrary, there are stabilizers such as manganese, chromium, molybdenum and vanadium. Low carbon content may also be considered a stabilizer.

Usually carbon, silicon, manganese, sulphur and phosphorus are determined as well as alloying elements, if any. Several chemicals from scrap may reach the cupola. There may be paints, enamels and other coatings on scrapped parts. Elements not determined, and unknown or unexpected elements, may cause graphitization or an extreme possibility of pearlite decomposition at elevated temperatures.

Subversives—There may also be some unknown and unexpected stabilizers. If they are present, castings may have a chilled case and machining will be difficult or even impossible.

Nickel (1.5 to 2 per cent) does not stabilize pearlite. Purpose of nickel is to assure a uniform graphitization and to prevent formation of free cementite.

Cast iron having an analysis of: Total carbon 3.02, manganese 0.62, silicon 2.25, nickel 0.90 and an as-cast hardness of BHN 163, lost its hardness when slowly cooled from 1550°F. The hardness was only BHN 130. Hardness samples had a Rc hardness of 43.

Pattern—Castings having thin sections solidify very often in the following manner: Areas close to the mold—eutectic graphite with ferrite; areas in center of section —some eutectic graphite with ferrite, some random dispersed graphite and some pearlite.

At the same time a cast iron having an analysis of: Total carbon 3.25, manganese 0.920, silicon 1.90, chromium 0.15 had an as-cast hardness of BHN 217, as-quenched hardness of Rc 53, and the hardness after slow cooling was BHN 200. For this reason, a stabilizer should be present in cast iron if proper hardenability is desired.

Good One—One company produces cast iron cylinder liners with the following analysis: Total carbon 2.80 to 3.20, combined carbon 0.60 to 0.75, manganese 0.80 to 0.90, silicon 1.70 to 2.10, nickel 1.00 to 1.50, chromium 0.15 to 0.30.

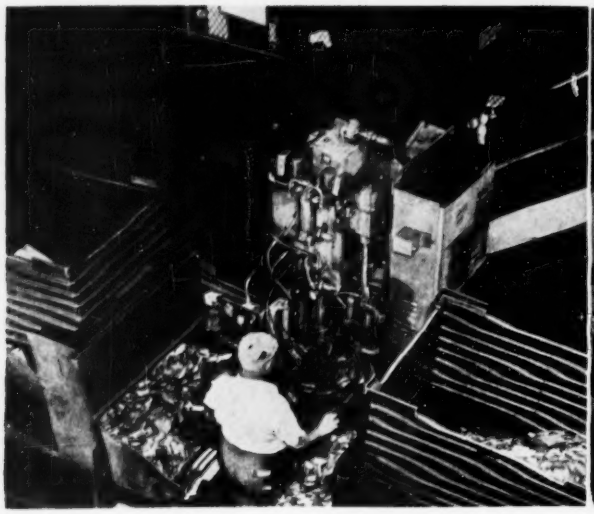
This analysis is particularly well suited to thin sections, since nickel promotes a uniform graphitization and prevents chill, while chromium assures a fully pearlitic matrix. Chromium makes pearlite dense and sorbitic. Fine, random dispersed graphite and a fully pearlitic matrix may be obtained by a special metallurgical processing. However, some chromium (0.10 to 0.20 per cent) assures a proper hardenability.

Nickel Quality—Nickel is particularly desirable for some castings, but to allow for heat treat, chromium, molybdenum or vanadium should also be present.

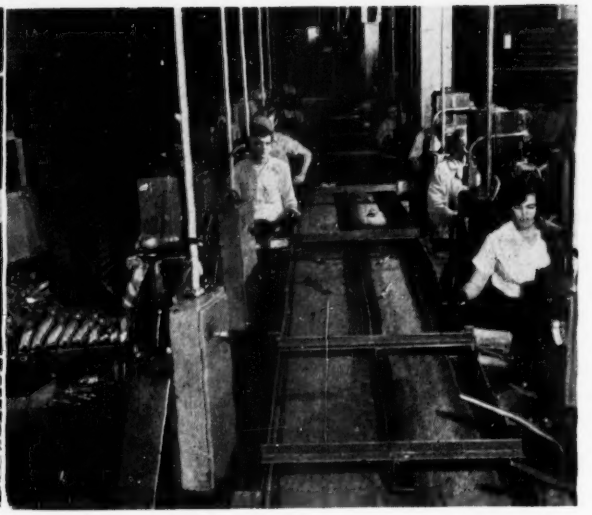
For some time, we used a molybdenum cast iron without nickel, but with 0.20 per cent molybdenum. It was a good cast iron for our purpose. Hardenability was excellent. Nickel prevents chill and promotes uniform graphitization even if metallurgical processing is unfavorable. However, nickel does not prevent the formation of dendritic structure, eutectic graphite combined with free ferrite and ferrite. Figs. 10 and 11 show a nickel cast iron having an undesirable structure.

Proper metallurgical processing will deliver perfect grades of plain cast iron. Since castings should be furnace heat-treated and since a prolonged heating time is to be expected, stabilizers should be added. A chromium, molybdenum or vanadium content of 0.10 to 0.20 will do the job.

Hardenability of cast iron depends not only on analysis, structure and as-cast hardness, but it also depends on stability of pearlite. Since a decomposition of pearlite during the prolonged heating (as in furnace-treated, large castings) causes a low hardness of hardened castings, samples are heated to 1550° F and slow cooled in the furnace.



Welding machine operator receives continuous supply of fender brackets. Stand and box on either side of operator feed parts at work-level position; then welded assembly is tossed into a third box located behind positioner at left



Trunk lid hinge components flow from drop-bottom boxes into positioners along this conveyorized assembly line at Ford's Dearborn plant. Assembly proceeds smoothly as operators pick parts continuously from each stand's work tray

SMALL PARTS HANDLING

Two Part System Means Perpetual Positioning

Drop-bottom box and stand feed small parts at work height in two Ford stamping plants. Result is a profitable production increase per shift on each operation

PRODUCTION men have learned, often from painful experience, that a likely place to look when a bottleneck exists is small parts handling. In many cases such a slowdown stems from thoroughly engineering conveyor and assembly equipment to fit major components and literally leaving minor parts to fend for themselves.

Not so at Ford Motor Co.'s two Metal Stamping Division plants. Both the new works at Buffalo, N. Y., and the older Dearborn, Mich., operation have turned to a system that achieves perpetual work positioning and complete flexibility. Machine operators get continuous material supply at work-level position with these two-part positioners made by Union Metal Mfg. Co. Ford engineers worked closely with the Canton, O., firm in making final design refinements.

The Right Part—Key to the system is spotting the right part at operators' fingertips and having it there when they need it. Machine slow-down caused by operators' being forced to stoop or stretch to reach parts, or waiting for materials to arrive, is eliminated.

The two units, named the Work-O-Matic and including a drop-bottom box and positioning stand, have been the subject of considerable Ford studies. Results show production per shift per operation increased sharply at work stations served by the box and positioner setup. The Stamping Division first used ten of the bin-stand combinations on a study-trial basis for six weeks in 1951 to get data that support broad application.

Handling flexibility inherent in the equipment also is important to production procedure changes. It's a fast and simple job for a fork truck operator to relocate a stand

as the need arises. He can also drop-bottom dump contents from a partially filled box into another to cut the number of containers required on a job. Because of the operation's size, Ford doesn't tie up trucks with the transfer task but uses a trackless trailer train—also designed by Union Metal. Trucks are used, however, to fork lift boxes onto positioning stands. During the switch in boxes, the operator's material supply is not interrupted, because the stand's tray holds 25 per cent of the box contents.

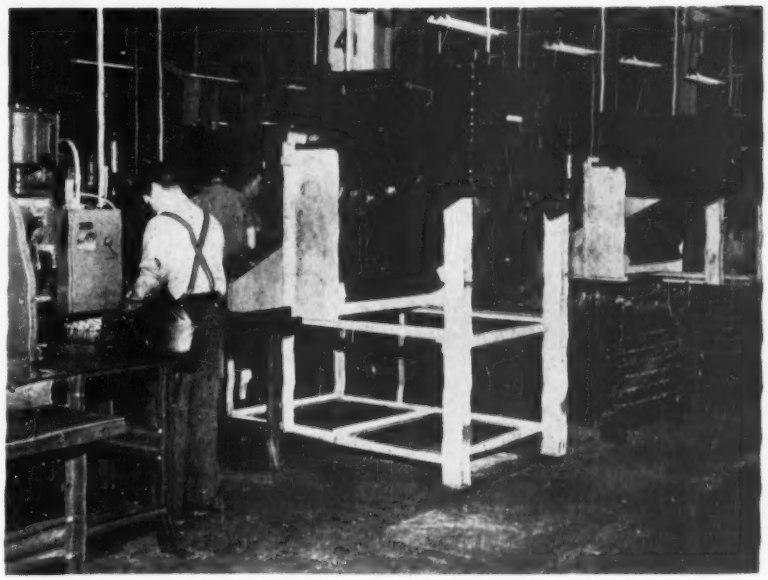
Capacity, Construction — Each drop-bottom box used by Ford *holds 6000 pounds of small stampings*, in a volume of 20.2 cu ft. *Truck operators dump the stampings* safely and accurately from any height within range of the truck's mast at a constant discharge point.

An I-beam abutment at the front of the box prevents it from slipping along forks during dumping action. Boxes, made from 12-gage corrugated steel, have a one-piece ½-inch steel plate hinged bottom. Fork entry is made from either side, hinge end or diagonally at the rear corners. Double-locking tiering angles at all four corners permit safe stacking.

In-Process Storage—Adjustable, vertical control gate at the front of the positioning stand regulates parts flow according to piece size. Need for this gate resulted when Ford engineers increased angle of incline between box bottom and positioning stand from 20 to 30 degrees. The automaker was also responsible for stand's removable tray end. Latter permits fast job finish-off when the stands must be freed quickly for another job.

Stamping Division uses about 3000 boxes for positioning in stamping, welding and tapping at 200 work stations. Number of boxes exceeds stands for two reasons: Same design box feeds and receives parts; a backlog of boxes is tiered for in-process parts storage.

Material is loaded into boxes at receiving point; loaded boxes are moved to storage and tiered. From there they are fork lifted to the first operation, then go to in-process storage until parts are needed for subsequent operations. Result is to insure a bank of stampings ready for the cycle run.

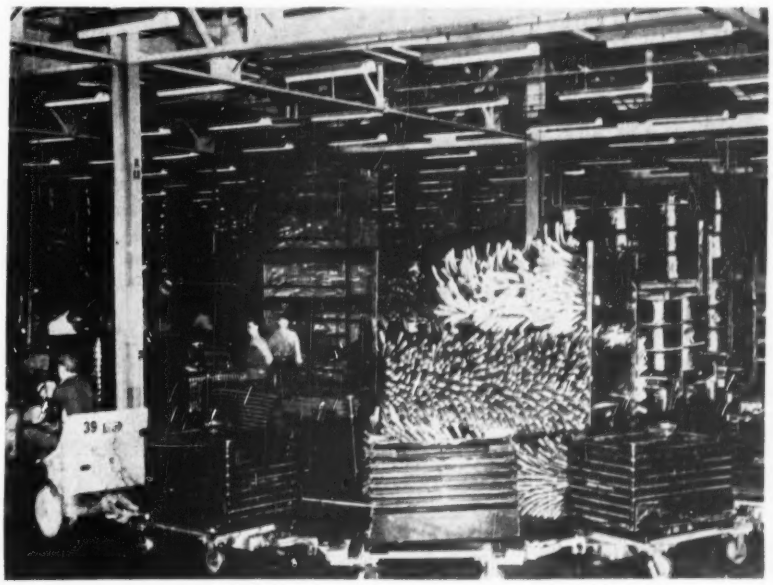


Two stands feed assembly machine operators, while other bins are kept ready for use. No time is lost in switch, because tray holds 25 per cent of contents

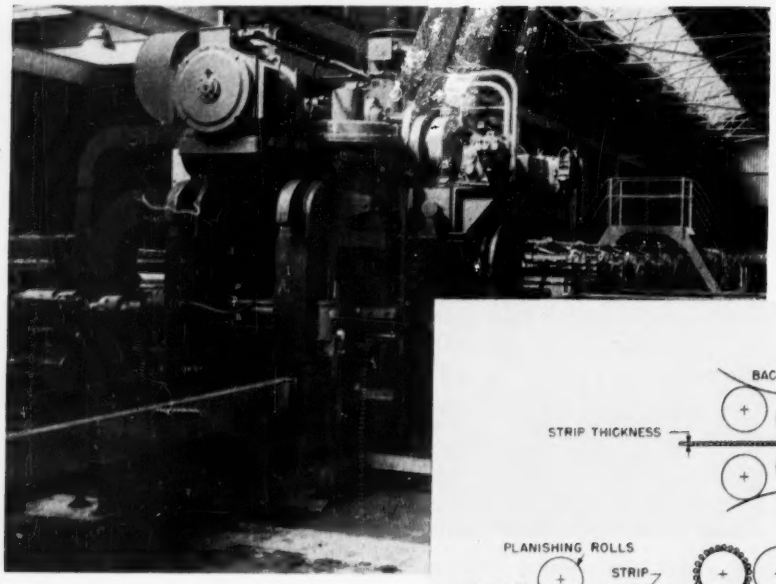
Conveyor line method of handling small parts was rejected because it involved a second man to hang parts on the line. In addition, there could be no bank of parts accumulated.

Scrap Handling Too — Division also employs drop-bottom units for some of its scrap handling. Scrap slugs are loaded directly into gondola cars from the boxes.

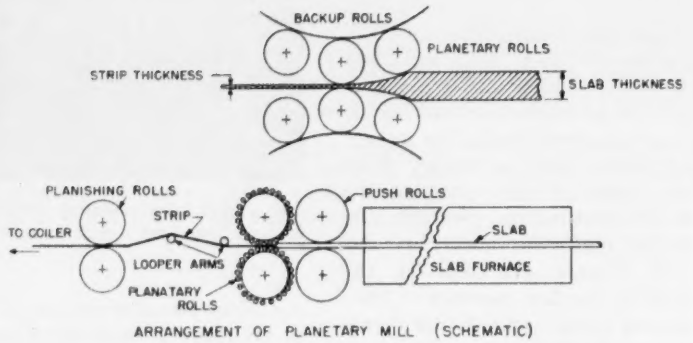
Because of thrust action in drop-bottom dumping, gondolas can be loaded completely from one side only. Ability to load from one side is enhanced by design that permits discharge point selected by operator to remain constant throughout dumping operation.



Trackless trailer, also developed by Union Metal, moves Work-O-Matic boxes on six open-frame dollies. Train turns any corner a single trailer can negotiate



Finishing end of 2-stand planetary mill showing specially-designed sectional furnaces in rear. Below is shown a schematic arrangement of the push, planetary, and planishing rolls



ARRANGEMENT OF PLANETARY MILL (SCHEMATIC)

Rolls Hot Strip ON PLANETARY MILL

Slabs are heated in a series of small oil-fired furnaces coupled together to form a continuous train and electronically controlled. New mill provides accurate gages

HOT ROLLED mild steel strip 15 inches wide and in 2-ton coils now is being produced on England's first planetary hot mill of the Sendzimir type at the Jubilee Works, Ductile Steels, Inc., Short Heath, Willenhall, Staffonshire. Later, the mill will be scheduled on carbon steels up to 1 per cent, stainless steels, silicon iron and alloy grades.

The planetary assembly consists of 2-inch diameter work rolls equally spaced around the 20-inch backup roll circumference. The backup roll is driven by a 900-hp constant speed motor operating at 500 rpm. The small work rolls are free to rotate around the backup roll and are synchronized with one another, rotating at an approximate speed of 230 rpm. The speed of the 2-inch work roll is about 3000 rpm.

Makes Initial Reduction — The push rolls, 22 inches in diameter, make an initial reduction and then push the slab through the planetary rolls at a selected speed in keeping with the finishing gage. These rolls operate at a speed ranging from 4.5 to 9 rpm and are driven by a 30-hp motor. The slow movement of the slab and the much greater speed of the planetary rolls enable a small reduction to be made each time the work roll contacts the slab. As soon as one length of slab is rolled it is pushed through the planetary rolls by the oncoming length.

Immediately following the planetary mill is a stand of 2-high planishing rolls which are driven by a 200-hp motor at speeds varying from 14 to 43 rpm. The planishing mill further reduces the thickness and imparts a flat hot rolled finish to the surface. Between the planetary and planishing mills a conventional looper arm regulates the correct amount of tension to the strip.

Adjustments of the push, plane-

New "nerve-center" controls sinter quality and quantity

THIS is the master control panel of a modern high-capacity sintering plant recently completed by McKee.

It enables a single operator to regulate the volume of material to the table feeders; volume of fines; speed of the sintering machine; water to pug mill; volume of air to sintering machine; synchronize all functions with the speed of the sintering machine; communicate with all plant operating personnel.

Visual and recording instruments are kept clean and free from abrasive dust in a pressurized enclosure. All controls are at the operator's finger-tips.

The pin-point control of operation provided by this equipment helps to produce *maximum tonnage of highest quality product.*

If you want results like this call in McKee. We'll be glad to discuss your ore preparation requirements.

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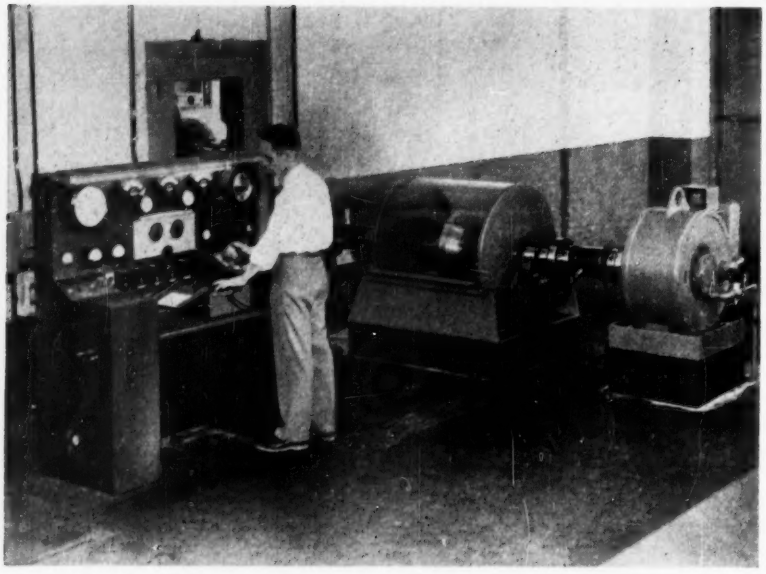


Test Setup Meters, Measures Torque Converters

In this setup for testing torque converters at National Supply Co.'s Toledo, O., plant two SR-4 torque meters and two SR-4 load cells measure torque and thrust. The Baldwin-Lima-Hamilton test devices are located on the driving shaft (left) and driven shaft (right) of the converter, which is in a transparent enclosure. Test values of hydraulic thrusts parallel with the shaft are measured by load cell enclosed below driven end and another on driving end

tary and planishing rolls are effected by screwdown gears; the motion is measured on a Selson drive—one to each screwdown mechanism.

Affords Close Tolerance — The mill is designed to produce 10 tons an hour but this can be increased. Strip width ranges from 6 to 15 inches and gages from 0.187 to 0.040-inch. The thickness of the strip is exceedingly accurate; a 30-foot slab rolled into a coil does not vary more than 0.002-inch from end to end and across the width of the strip.

Small separate furnace units are employed for heating the semi-finished material. Slabs are fed lengthwise and are conveyed continuously through the various furnaces by water-cooled rolls. The heating temperature is controlled by the number of furnaces used. Advantage of this new type furnace is that the lengths of slabs can be varied from 15 feet up to the maximum length of 45 feet.

Should any one particular furnace unit collapse or require repairing it can be removed and a spare unit substituted, thus obviating loss of production. The furnace is oil fired and electronically controlled by Ether equipment and proportion valves. Button control also is provided on the furnace panel. Temperatures are recorded by thermocouples and recorders at each zone.

Manifolds: 206 per Hour

A special machine tool of its Transfer-matic type is announced by Cross Co., Detroit. Capable of machining two parts at one time, the new machine has 14 stations—twelve for working, one for loading and one for unloading. It machines intake manifolds at a rate of 206 per hour, performing 100 operations.

Features include palletized work holding fixtures with power wrenches for automatic clamping, and an integral conveyor for automatic return of palletized fixtures from the unloading to the loading station.

In addition, the machine has automatic chip removal, hardened and ground ways and automatic lubrication system.

CALENDAR OF MEETINGS

December 29, American Association for the Advancement of Science: Panel discussion on visual performance and testing procedures, Bradford hotel, Boston. Panel chairman: Dr. N. Franklin Stump, Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N. Y.

January 5-7, American Road Builders' Association: Annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Association address: World Center Bldg., Washington 6. Secretary: Lt. Gen. Eugene Reybold.

January 11-13, Truck-Trailer Manufacturers Association Inc.: Annual meeting, Boca Raton hotel and club, Boca Raton, Fla. Association address: 1024 National Press Bldg., Washington 4. Managing director: John B. Hulse.

January 11-15, Society of Automotive Engineers Inc.: Annual meeting and engineering display, Hotels Sheraton-Cadillac and Statler, Detroit. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

January 11-16, Association of Steel Distributors: Annual meeting, Lord Tarleton hotel, Miami Beach, Fla. Association address: 29 Broadway, New York. General counsel: Morris Rosoff.

January 12-14, National Constructors Association: Annual meeting, Hotel Commodore, New York. Association address: 50 E. 41st St., New York. Secretary: C. B. Bronson.

January 13, American Boiler Manufacturers Association & Affiliated Industries: Winter meeting, Hotel Cleveland, Cleveland. Association address: 1571 W. 117th St., Cleveland 7. Secretary: A. C. Baker.

January 14-16, National Tool & Die Manufacturers Association: Board of trustees and committee meeting. Hotel di Lido, Miami Beach, Fla. Association address: 907 Public Square Bldg., Cleveland 13. Executive secretary: George S. Eaton.

January 15-16, Machinery & Allied Products Institute: Second session, seventh conference on capital goods economics, Edgewater Beach hotel, Chicago. Information: Secretary, Charles W. Stewart, 1200 18th St. NW, Washington 6.

January 17-19, Institute of Scrap Iron & Steel Inc.: Annual convention and exhibit. Hotel Statler, Washington. Institute address: 1729 H St. NW, Washington 6. Executive vice president: Edwin C. Barringer.

January 18-22, American Institute of Electrical Engineers: Winter general meeting, Statler hotel, New York. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

January 19-21, Caster & Floor Truck Manufacturers Association: Winter meeting, Hotel New Weston, New York. Association address: 27 E. Monroe, Chicago 3. Executive secretary: H. P. Dolan.

January 20, American Society of Body Engineers: Annual meeting, Detroit. Society address: 100 Farnsworth Ave., Detroit 2. Secretary: Edward Wachnicki.

January 20-21, Steel Shipping Container Institute Inc.: Winter meeting, Hampshire house and Hotel Pierre, New York. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

January 21, American Coke & Coal Chemical Institute: Western regional meeting, Drake hotel, Chicago. Institute address: 711 14th St. NW, Washington 5. President: Samuel Weiss.

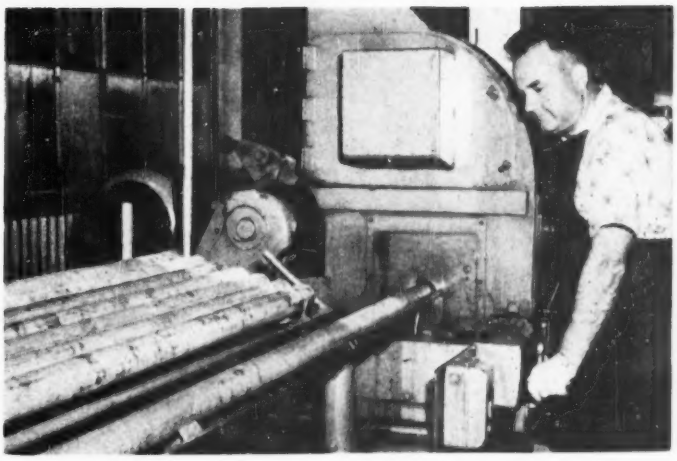
January 21-22, Steel Plate Fabricators Association: Annual meeting, Palmer House, Chicago. Association address: 37 W. Van Buren St., Chicago 5. Secretary: J. Dwight Evans.

January 21-22, National Industrial Conference Board Inc.: General session for all associates, Hotel Astor, New York. Board address: 247 Park Ave., New York 17. Secretary: Herbert S. Briggs.

January 22, Malleable Founders' Society: Semi-annual meeting, Hotel Cleveland, Cleveland. Society address: 1800 Union Commerce Bldg., Cleveland 14. Managing director: Lowell D. Ryan.

Abrasive Wheel Doubles Tube Cutting

Using thousands of pieces of stainless steel tubing each month, Ryan must precision-cut them from 20-foot sections. High speed wheel and clamping devices make it easy



From Ryan-built loading rack, 20-foot stainless steel tubes are fed rapidly into Campbell cutting machine. Sizes: 1 to 17 inches

WITH a new abrasive-wheel cutting machine they're slicing $32,000 a year from tube cutting costs at Ryan Aeronautical Co., San Diego. Burning through stainless steel at twice the speed of standard cutting tools, the new device was developed by the Campbell Machine Co. of Bridgeport, Conn.

Ryan uses thousands of short pieces of stainless steel tubing each month in ball-and-socket joints, nipples and sleeves of exhaust systems. They must be precision-cut from 20-foot long pipe to various lengths running from one to 17 inches. A wide variety of diameters and wall thicknesses is used but the bulk of the production is cut from diameters of 2⅜-inch with 0.065-inch wall thickness.

Old Way — For a number of years Ryan has cut these tubes with tube cutting lathes. The 20-foot lengths of pipe were clamped in a chuck and rotated against high speed cutting tools. All operations, including clamping, feeding, cutting and removal were accomplished manually.

After cutting, tubes had to be deburred individually by means of a machine which inserted a three-pronged cutting tool within each tube and rotated it. This procedure required four employees and four machines to produce 1000 finished tubes within an 8-hour shift. With only one new Campbell machine, Ryan can produce 1000 finished tubes within an 8-hour shift. Only one operator plus a few minutes of time from a second employee is necesary.

High Speed Wheel—Instead of a steel cutting tool, the Campbell machine employs a 20-inch diameter abrasive wheel which is ⅛-inch thick. Spinning at high speed this wheel literally burns its way through the tough stainless steel tubes in one second. A flood of coolant is sprayed into the cutting area by means of a motor-driven pump system. The coolant removes heat and residue from the cutting area. Care is taken to direct equal amounts of coolant to both sides of the abrasive wheel in order that an even temperature is maintained to prolong wheel life.

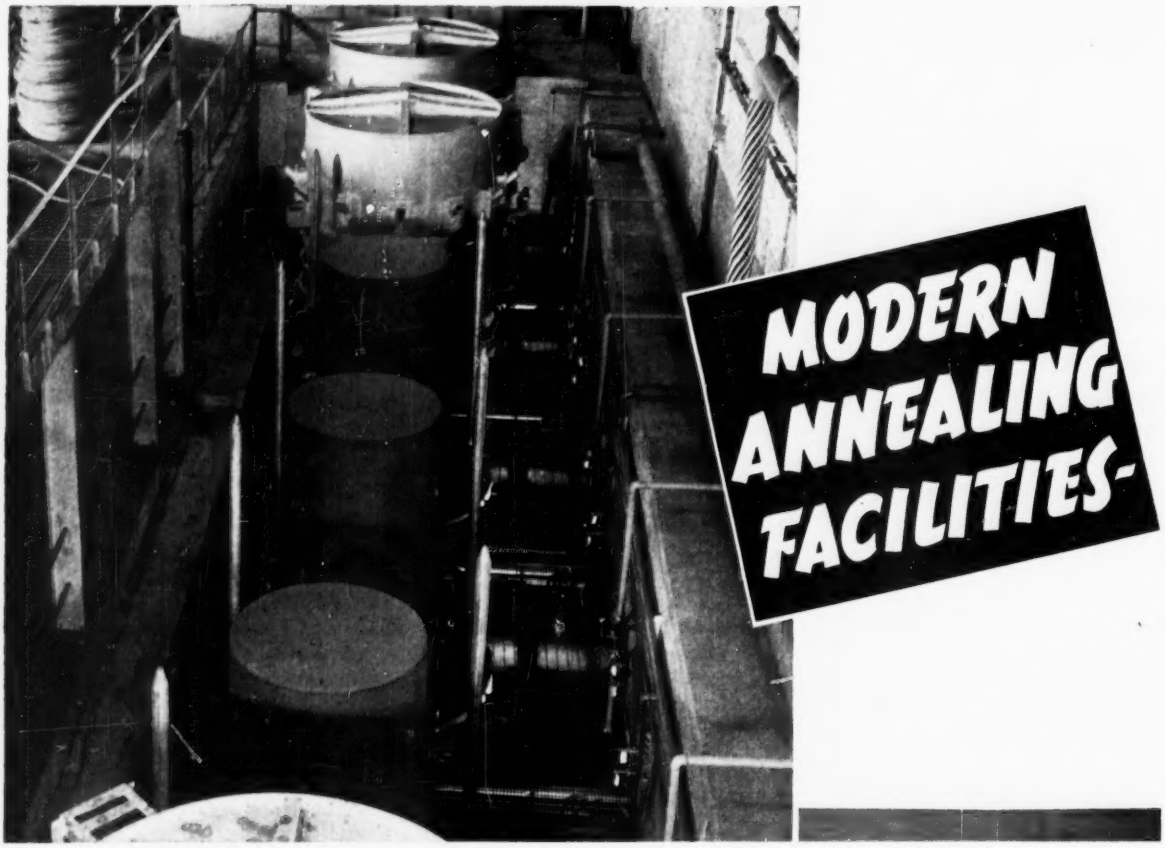
Clamping and cutting action of the machine is accomplished hydraulically. All the operator has to do is feed the pipe into the machine and depress a lever. The lever brings the clamps down on the pipe to hold it rigidly in place. This is followed by the automatic action of the spinning abrasive wheel which comes down to slice through the tube. When the operator raises the lever, process is reversed. The wheel is entirely free of the tube before the clamps are released so that the wheel does not drag the tube with it.

Tumble Deburring — Burr produced by this type of cutting is burned and brittle and can be removed by tumbling. In approximately four hours they emerge bright and burr-free. Only employee time required for this operation is that taken to load and unload the tumbling machines which hold several hundred parts. Company estimates that deburring these tubes by tumbling costs two cents per tube contrasted with eight cents per tube under former methods.

Ryan production engineers have designed and built a speical loading rack which attaches to the Campbell machine and holds a half-dozen 20-foot tubes ready for feeding. Also, an ejection mechanism has been installed in order that each cut tube can be automatically ejected into a box.

Good Accuracy—Fitted with a micrometer type work stop, the new machine is extremely accurate and can cut desired lengths within two thousandths of an inch. It is powered with four electric motors for cutting, hydraulic system, coolant distribution and oscillating mechanism. The oscillating system causes the wheel to move back and forth across the work at the time of cutting. This movement is desirable in cutting solid rod stock because it produces a smooth-finish cut.

Ryan is employing this technique in cutting stainless steel rod to produce jet engine fittings. In tube cutting, however, Ryan has found that wheel life is doubled when the oscillating action is not used, and other advantages, such as speed, are not affected.



For Cold Finished Alloy Bars

These modern furnaces insure uniform annealed quality, which is another important reason why Youngstown Cold Finished Alloy Bars are so satisfactory.

Their machinability and cold working properties are superior. Tolerances, metallurgical characteristics and all phases of the manufacture of Youngstown Cold Finished Alloy Bars are subjected to rigid quality control of a single integrated organization—from mining of the ore to shipment of the finished product.

Youngstown Cold Finished Alloy and Carbon Steel Bars are furnished in standard shapes and sizes, in both coils and straight lengths. For further information, phone or write our nearest District Sales Office.

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NEW PRODUCTS and equipment

Reply card on page 83 will bring you more information on any new products and equipment in this issue

Sheet, Wire Stiffness Tester

. . . readings directly from dial

Both initial and basic stiffness of sheet and wire specimens can be determined by this model 150 stiffness tester. Model is more sensitive than previous units, having eight test ranges instead of six.

Test length, angle of deflection

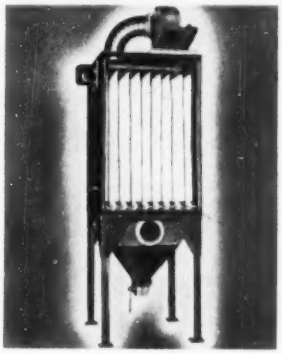
and rate of loading are all standardized for accurate test results among different laboratories. Readings are taken directly from dial, making reference charts and tables, and lengthy calculations unnecessary. Taber Instrument Corp., Section 31, 111 Goundry St., N. Tonawanda, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 1

Cloth Bag Dust Collector

. . . designed for indoor use

For smaller volume applications, this type CN cloth bag dust collector is designed for indoor use, and cleaned air frequently can be discharged inside the plant. This is a distinct saving where air is heated or cooled. Cloth bags are made of heavy-weight, sateen weave, cotton filter fabric stitched vertically to form multiple tubes. Collector casings are constructed



of heavy-gage steel, with gasketed flanges bolted to substantial structural frames. One side of the casing is fitted with removable doors, top and bottom, for bag removal. Seven sizes of the CN collector are available, from 200 to 1000 sq ft of cloth area. Pangborn Corp., Dept. ST, Hagerstown, Md.

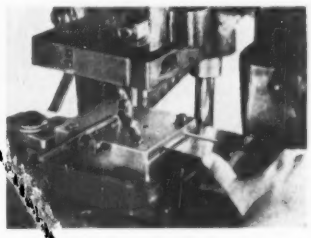
FOR MORE DATA—CIRCLE REPLY CARD NO. 2

Universal Automatic Stop

. . . standardizes on stock unit

Installation in a few minutes' time, plus excellent versatility, are improvements made in this universal automatic stop. The device is designed to eliminate necessity of handmade stops and standardize on a stock unit capable of satisfying every application.

Carried in two sizes, this stop will work on any kind of die and accommodate all jobs up to the very large dies that would require custom-made stops in any case. To install, it is simply attached to front of stripper with two screws and a hole drilled for arm at gaging position. Built in is a spring that provides pivotal action as well



as side movement. R. Krasberg & Sons Mfg. Co., Dept. ST, 2501 W. Homer St., Chicago 47, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Perspective Graphs

. . . 14 different views

Perspective graphs for scaling directly from engineering drawings into accurate, distortion-free perspective views are available in a 20 x 33-inch size. Subject can be drawn as the eye actually sees it.

Each graph can be used as a top view or—by inverting it—as a bottom view, allowing a choice of 14 different views. Tech-Art Graphs, Dept. ST, 315 S. 15th St., Philadelphia 2, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 4

Portable Drilling Machine

. . . works from any position

This portable drilling machine can work from any position around large unwieldy steel beams, girders and weldments. Machine operates by pushbutton and drills holes up to 2 inches in diameter at right angles to work surface. Suspended from crane or other overhead structure, unit can be moved with considerable dexterity over and

SPECIFY

FOLLANSBEE COLD ROLLED STRIP

Leading manufacturers of precision parts are using Follansbee Cold Rolled Strip in coils for all types of stamped and formed products.

The finish, temper and uniform tolerance of Follansbee Cold Rolled Strip make it a highly desirable steel for precision jobs on your presses. Follansbee coils can be supplied with I.D. and O.D. for any production set-up.

Follansbee can give you warehouse type service from the mill—providing a continuous supply of custom-quality Cold Rolled Strip Steel from coils to your presses, regardless of forming operations involved.

The Follansbee Steel Representative nearest you will give you full information. It will pay you to discuss your fabricating problems with him today.

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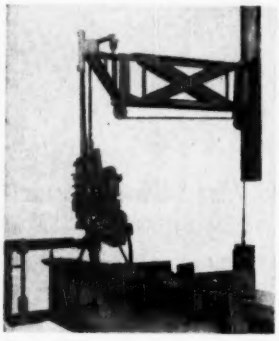
Cold Rolled Strip
Stainless Terne Roll Roofing
Polished Sheets and Coils

FOLLANSBEE METAL WAREHOUSES

NEW PRODUCTS and equipment

around workpieces too bulky to be handled on conventional equipment.

Drilling operation is vibrationless, so maximum drilling speeds



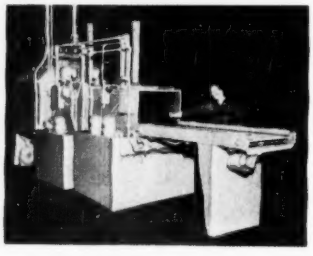
and feeds are obtainable. Artos Engineering Co., Dept. ST, 2757 S. 28th St., Milwaukee 46, Wis.

FOR MORE DATA—CIRCLE REPLY CARD NO 5

Brine Quench Unit

. . . automatic work transfer

Completely automatic transfer of the work load from furnace through quench features this self-contained brine quench unit.



Quench is available in load capacities of 300, 400 and 700 pounds. Solution temperatures, work handling and solution circulation all are controlled by presettings on controls built into the regular furnace control panel. Brine solution temperature is controlled by im-

(Continued on p. 86)

USE A REPLY CARD

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59. Fork Attachments

Lewis-Shepard—So that the fork truck user can select the correct type of fork for his operating requirements, 2-page illustrated data sheet describes various fork types available. Included are pallet, saber, chisel and paper roll forks. Also shown are tubular crane arm and a coil lifting ram, both interchangeable with forks.

60. Overhead Handling Systems

Forker Corp.—Series of illustrations and drawings in the 8 pages of catalog 109 are used to show line of Ohio Tramrail systems. Data on Teerail track and heavier Beamrail truck are presented, as are tramrail trolleys and switches, jib and gantry cranes.

61. Power Shears

Cleveland Crane & Engineering Co.—Pivoted-blade power shears in 31 sizes ranging in capacity from 6 ft by 10 gage to 12 ft by 1 in. are described and illustrated in catalog 2011-E. Specifications are given.

62. Aircraft Adhesives, Sealers

Minnesota Mining & Mfg. Co., Adhesives & Coatings Div.—Typical applications of adhesives, coatings and sealers in the aircraft industry are illustrated and described briefly in 12-page booklet. Reader will become acquainted with the combination of 3M products, aircraft industry experience and engineering service available to solve simple or complex manufacturing problems.

63. Precision Grinders

Landis Tool Co.—20-page illustrated catalog F-53 describes 18 and 24-in. plain and roll grinders. It contains 37 photos, 7 sketches and complete specifications. Design and construction features are described.

64. Clad Metals

Superior Steel Corp.—"An Introduction to Clad Metals" is profusely illustrated booklet which comprehensively surveys the manufacture and applications of stainless-, copper-, brass- and other clad steels produced by Superior Steel and other companies. Clad metals are widely used in the chemical, petroleum, automotive, electronic, food processing and other major industries. Past and present basic cladding equipment and processes are shown.

65. Lathes

Nebel Machine Tool Co.—Line of engine, removable block gap and extension bed gap lathes is described in illustrated bulletin 3/n of 4 pages. Features are outlined and detailed specifications are given.

66. Drive Controls

Reeves Pulley Co.—24-page bulletin G-537 "Reeves Automatic Production Control" covers the line of automatic controls available on Reeves variable speed drives. Emphasizing "join the swing to automation," booklet also discusses means of solving problems involving control of tension, acceleration and deceleration, velocity, synchronization, etc.

67. Planetary Speed Reducers

Philadelphia Gear Works—Several improvements have been incorporated in the Philadelphia line of planetary speed reducers. Units are available in single, compound or double types, and horsepower ratings are AGMA class 1. Standard ratios range from 4.3:1 to 106:1. Full data are presented in 16-page illustrated catalog P-53.

68. Conveyor Chain

Farrell-Cheek Steel Co.—Alloy cast steel conveyor chain is subject of catalog 40M-GR. Illustrations and text show wide variety of types including pintle, detachable and riveted-less styles. Complete specifications are also given and attachments shown.

12-28-53

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69. Motor-Cylinder

Westinghouse Electric Corp.—How Motocylinders can be employed to flip, turn, release, raise or lower material in repetitive cycles is disclosed in booklet B-6090. The motocylinder is an adaptation of a gearmotor, utilizing a high-torque, high-slip electric motor and short crank on output shaft to transform rotary to reciprocating motion. Rating and characteristics are given.

70. Industrial Engines

White Motor Co.—The White Mustang industrial engine built in range of sizes of 50 to 200 hp is featured in descriptive 4-page folder. Engines are now available for LPG fuel as well as for gasoline. Applications are described.

71. Plating Cylinders

Singleton Co.—Complete line of H-T Sincolite acid and alkali-resistant replacement plating cylinders which reportedly fit any plating barrel superstructure, new or old, is shown in 4-page bulletin RC-101. Line is suitable for complete range of cleaning, pickling and plating cycles. All have heavy-ribbed design and fusion-welded construction throughout.

72. History of Broaching

Colonial Broach Co.—Past, present and future of broaching are described and pictured in condensed form in the 35th anniversary issue of "Broaching News." Twelve pages trace developments of the past and achievements of the present.

73. Pneumatic Conveyors

Gerwin Industries, Inc., Whirl-Air-Flow Div.—Details of a new pneumatic pipeline system for moving foundry and core sands are presented in 4-page illustrated bulletin WAF-100. Consisting of Transporter, pipeline and transfer switches, system is offered in three sizes with capacities of 7½, 15 and 30 cu ft. Sand is delivered in desired quantity exactly where it is needed.

74. Milling Machine

Greaves Machine Tool Co.—Design features and specifications for No. 2-H plain and universal milling machines are found in 4-page illustrated folder 2/Gr. Various attachments are described.

75. Electric Equipment

Electric Equipment Co. — 32-page catalog 54 tabulates an extensive inventory of motors, compressors, motor-generator sets, transformers, diesel sets, circuit breakers and other electric equipment, new and guaranteed rebuilt from 1 to 7500 hp. Stock includes equipment in 25, 40, 50, 60 cycles (and high cycle), all volts and 2/3 phase, and direct current types in all voltages.

76. Conveying Equipment

Rapids-Standard Co.—16-page illustrated catalog GC-53 contains complete information on the Rapistan line of portable and permanent type belt, gravity wheel and roller conveyors in steel and lightweight aluminum, as well as data on casters and hand trucks for wide range of materials handling applications.

77. Electric Hoists

National Screw & Mfg. Co., Chester Hoist Div.—Capacities of ¼, ½, 1 and 2 tons are included in the line of model E wire rope hoists, and ¼, ½ and 1 ton sizes are offered in EC line of electric chain hoists. Complete design and application data are given on these units in 6-page bulletin E853 and 4-page folder EC953.

78. Rectifier Substation

General Electric Co.—A new mechanical rectifier unit substation for providing direct current power is subject of 4-page illustrated bulletin GEA-6083. Having an efficiency of more than 96 per cent, these substations can be installed directly on any level floor. Complete switchgear is incorporated. Ratings are 12,000 amp at 250 v or below and 600 amps at 250-400 v dc.

79. Industrial Boilers

Kewanee-Ross Corp. — "Kewanee Boilers for Heating, Power and Process Steam" is title of 32-page illustrated general catalog No. 80. Sizes and types of units for practically every need are covered. Also described are storage and direct fired water heating products, as well as boiler accessories.

80. Hydraulic Components

Hydraulic Press Mfg. Co.—To simplify planning of hydraulic circuits and ordering of hydraulic components, set of nine catalogs on new line of components is available. No. 601 covers pumps, motors and power units; 701, 150-psi air or 300-psi oil hydraulic cylinders; 721, 2000-psi cylinders; 741, 3000-psi cylinders; 801,

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2000-psi valves, threaded connections; 821, 3000-psi valves, flange connections; 841, 3000-psi valves with gasket mountings; 901, accessories such as filters, gages, pressure switches and heat exchangers; and No. 1001, contains hydraulic engineering information.

EDITORIAL ARTICLES
Available in Limited Quantities

81. Vacuum Melting

STEEL article "Vacuum Melting Excludes Inclusions" by F. G. Stroke, National Research Corp., describes this process done in high frequency induction furnaces under vacuums of 1 to 10 microns. During the process, gases and high vapor pressure elements are distilled off and unstable oxides and nonmetallic compounds are decomposed. Result is a 'clean' product.

82. Precoated Metal Strip

"Precoated Strip Has Use Appeal," according to STEEL article of this title. It combines functional properties of nonferrous metals with wide utility and economy of cold-rolled, strip steel. Coats include lead alloy, brass, nickel, zinc, copper and lacquer. Article deals with precoated strip line offered by Thomas Strip Div. of Pittsburgh Steel Co.

83. Mechanization

"Two Approaches to Mechanization" is title of STEEL article which describes how the Hotpoint refrigerator plant and Curtiss-Wright Corp. profit by a mechanized, automated line in producing a consumer and nonconsumer product, respectively. In the Hotpoint system 1500 employees turn out a complete refrigerator every 40 seconds, while the new line at Curtiss-Wright has 250 per cent greater capacity than system it replaced.

84. Ultrasonic Testing

The ultrasonic method of nondestructive testing is particularly suited for inspection of heavy sections. Douglas Aircraft Co. uses it in their receiving department and along the line for inspecting forgings, plates and extrusions. STEEL article "Sound Waves Uncover Inner Flaws" describes this company's use of the ultrasonic method.

LATEST INFORMATION

on the Sperry ultrasonic testing REFLECTOSCOPE

IN EIGHT COMPREHENSIVE PAGES our new Bulletin 50-105 tells you just *how, where* and *why* this latest development in nondestructive testing instruments can cut your production and maintenance costs.

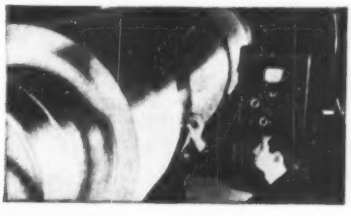
THE ULTRASONIC REFLECTOSCOPE is the unique, portable instrument that enables you to "see" inside a variety of metals and other materials. By means of a distinct pattern on a cathode ray tube, it enables you to locate and evaluate—*quickly* and *economically*—both surface and internal defects.

WHATEVER THE SIZE OF YOUR PLANT, applications are unlimited. You can *cut wasted machine- and man-hours* through fast, accurate quality-control of raw materials and machined parts. You can eliminate serious production delays through discovering fatigue cracks in your heavy equipment *before they lead to breakdown.*

OPERATION is simple—all electronic circuits are practically automatic. Penetration is deep—30 feet, for example, in solid steel.

THE REST OF THE STORY is contained in our new bulletin. To get your copy immediately, fill out and mail the attached coupon today.

The unique, economical Reflectoscope is now cutting production and maintenance costs in plants of all types and sizes all over the world.



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(Continued from p. 82)

mersion-type, finned cooling coils through which tap water passes.

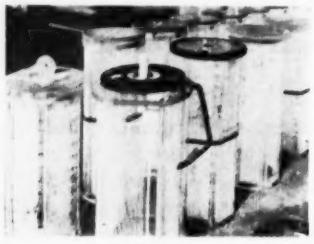
The compact, cabinet-type units are floor-mounted and completely piped and wired at the plant. Simple service connections complete the installation. Ipsen Industries Inc., Dept. ST, Rockford, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Replacement Cylinder Line

. . . fits all barrel makes

Complete line of replacement plating cylinders to fit all makes of barrel superstructures should serve the purpose of redeeming many otherwise obsolete barrel



superstructures. Made of H-T Sincolite—H-T Lucite Plexiglas the cylinders consist of two heads, six heavy rails and five panels. Fusion-welded construction throughout has tensile strength of 10,000 psi. With no dangerous stresses from heating and bending, they hold their shape permanently without distortion in temperatures up to 200° F. Singleton Co., Dept. ST, 5317 St. Clair Ave., Cleveland, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 7

Bolt-Rivet Fastener

. . . permanent, rigid locking

Characteristics of bolts and rivets are combined in one fastener, the Lockbolt, that draws work tightly together, then is permanently and rigidly locked in place in one fast operation. There are no lockwashers, cotter pins, special nuts or lengthy bolts to consume time or add unnecessary weight to the installation. The fastener line offers savings in time and cost on production assemblies through fast installation and elimination of all fitting up operations. Lightweight pneumatic gun is capable of driving thirty or more fasteners per minute.

Fasteners consist of two parts: A bolt with locking grooves, instead of threads; and an aluminum alloy collar that serves the same purpose as a nut on a threaded bolt. Huck Mfg. Co., Dept. ST, 2480 Bellevue Ave., Detroit 7, Mich.

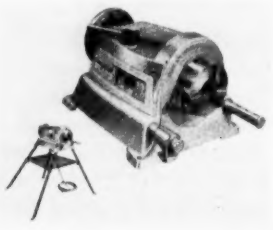
FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Portable Power Drive

. . . converts hand tools to power

Model 88 power drive is built for fast, efficient operation of hand pipe threaders, cutters and reamers. Aluminum housing holds down weight to 140 pounds, increasing ease of portability. The unit converts hand tools to power in the shop or on the job anywhere.

Drive has three-jaw scroll chuck on front with six pinions for greater convenience. Only occasional lubrication is required for steel-backed bronze bushings on spindle, and spindle gear and drive pinion.



Recessed switch is protected against bumps. Toledo Pipe Threading Machine Co., Dept. ST, Toledo, O.

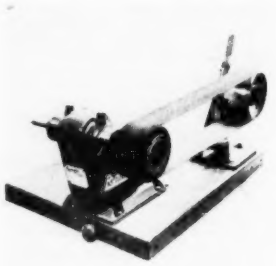
FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Belt Grinding Machine

. . . uses air-inflated contact

This belt grinding machine for deburring gears, finishing small castings, grinding all types of stampings uses an air-inflated contact wheel that is resilient and flattens out like an auto tire at point of contact. Result is considerably increased abrasive contact area.

Another effect is reported to be increased belt life due to self-cleaning action developed as the belt passes over flattened wheel area. Backstand assembly is designed for use with a 60-inch abrasive belt and will accommodate 5 and 8-inch diameter drums. Nu-



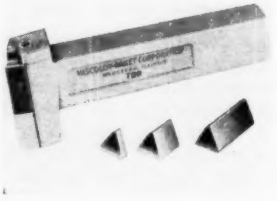
Matic Grinders Inc., Dept. ST, 8224 Carnegie Ave., Cleveland 3, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Vertical Toolholder

. . . correct chip formation

Built-in carbide chipbreaker in this vertical toolholder provides correct chip formation over wide cutting range for single chip-



breaker width, eliminating expensive chipbreaker grinding of inserts. Second feature: Method of holding the carbide insert permits using all of that insert.

Toolholder provides positive positioning of cutting edge in vertical as well as horizontal plane. All adjustments, location and clamping is done by one screw on top of the toolholder. Vascoloy-Ramet Corp., Dept. ST, Waukegan, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 11

Protective Enamel Coating

. . . withstands gases to 1400°F

Porcelain enamel devised for specialized use in the aluminum industry also holds promise for application in other operations, particularly chemical, zinc, lead and magnesium processing. As a protective coating material, the glass-based enamel is designed to multiply short-life span of iron and steel equipment exposed to corro-

sive chemical attack. Protection is directed against hot liquids and gases at temperatures ranging up to 1400° F.

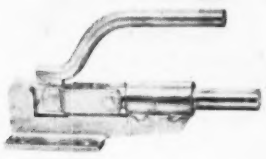
Development is a joint project of Battelle Memorial Institute, Columbus, O., and the manufacturer. Result should be a considerable savings in equipment maintenance and production time. Barrows Porcelain Enamel Co., Dept. ST, Cincinnati, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

Plunger-Type Toggle Clamp

. . . 3000-pound clamp pressure

Horizontal clamping pressure of 3000 pounds and 2-inch plunger stroke are two features of this Caddy P-2 plunger type toggle



clamp. In addition, the clamp boasts extra-large pivot pins and all welded construction that will not come apart even after pins become excessively worn.

Heavy steel frame will not spring or bend under maximum load. All-bronze plunger resists welding spatter. Erico Products Inc., Dept. ST, 2070 E. 61st Place, Cleveland 3, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Two-Piece Crucible Lining

. . . palletized, ready to use

This easy to install and maintain two piece lining for crucible furnaces is a foundry labor-saver. Lining is shipped on a pallet already assembled and ready to go into the furnace. Previously, linings have been installed in series of circular half-sections, usually 4½ inches high. These two-piece linings consist of two complete rings, each from 12 to 15 inches high, depending on furnace diameter.

Another practical consideration: Customer can see if pallet-mounted lining is in good shape upon arrival, without unpacking customary box crate. Electro Refractories & Abrasives Corp., Dept. ST, Buffalo, N. Y.

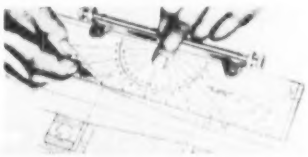
FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Pocket Drafting Device

. . . weighs less than 4 ounces

Functions of T-square, triangles, straight edge, scales and protractor are combined in this one simple unit without adjustments or additional parts. It weighs less than 4 ounces and is carried easily in the pocket or brief case.

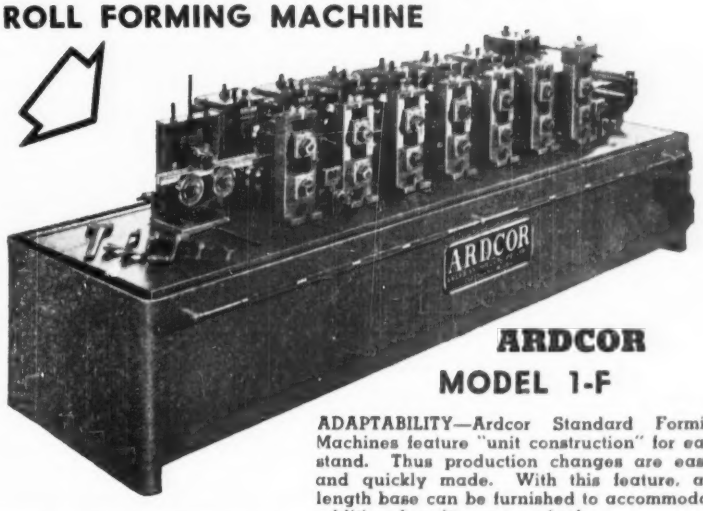
Device can be used on any flat surface for ordinary drawings, or to speed detail work on very large



drawings where drafting machine or T-square are used on the drawing board. Pickett & Eckel Inc., Dept. ST, Chicago 3, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 15

The Production-WISE
ROLL FORMING MACHINE



ARDCOR
MODEL 1-F

Spindle Diameter	1⅓"
Roll Diameter	4¼" to 7"
Horizontal Distance Between Spindles	12"
Roll Space on Standard Machine	10"
Capacity Max.	.072

ADAPTABILITY—Ardcor Standard Forming Machines feature "unit construction" for each stand. Thus production changes are easily and quickly made. With this feature, any length base can be furnished to accommodate additional units as required.

Ardcor Roll Forming machines embody the precision, accuracy and stability found only in the highest grade machine tools. In addition, Ardcor offers a completely engineered installation — cradle reels, roll forming machines, roller dies, flying cut-off fixtures, etc. —from one qualified source.

Likely as not your special shapes can be ideally handled by a standard Ardcor machine. Your inquiry is invited—without obligation.

Also Standard Machines up to 4½" Spindle Diameter.

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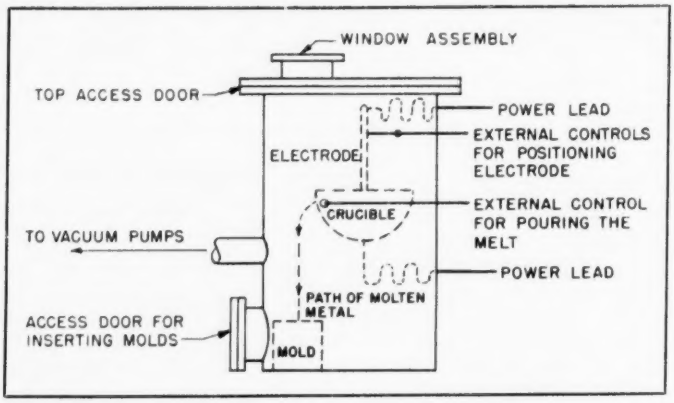


This large titanium casting is a cover plate produced on purchase order for the U. S. Army Ordnance Corps at Watertown Arsenal

Titanium Castings . . .

NEW PROCESS TAKES OUT THE BUGS

Finding a mold material that would stand up under molten titanium was the biggest headache. National Research solved that one and is ready to grant licenses

CASTING titanium and titanium alloys in intricate shapes is commercially feasible according to National Research Corp., Cambridge, Mass. The research division of NRC reports, after ten years of metallurgical work, that it is prepared to grant non-exclusive licenses on its process, supply necessary equipment and assist licensees in developing the process on commercial basis.

Biggest deterrent to titanium casting was the lack of mold material that could withstand the attack of molten titanium. Though not disclosing what mold material is actually used, NRC has apparently solved the problem.

Here's How—Pattern is made in the customary way, allowing for shrinkage factors of both metal and mold. A slurry mixture of powdered refractory and liquid binder is poured over the pattern and allowed to harden to form one half of the mold. Other half is prepared in the same manner. Low-temperature bakeout followed by high-temperature firing produces a strong cohesive mold. It is during the above steps that the mold is given special treatment that renders it impervious to the action of the molten titanium.

With the mold assembled with proper number of gates and risers, it is placed into the vacuum furnace, and titanium sponge or scrap is loaded into the crucible. Furnace is sealed and evacuated to 1 to 10 microns or 0.001 to 0.01 mm Hg., and argon is admitted to give suitable pressure for melting.

Melting and Casting — Arc is then struck and the melting in the crucible is begun. Observation window enables operator to tell when suitable quantity of metal has been melted, at which time power is cut off and the electrode is moved out of the way. Melt is poured into the gate of the mold which had been placed directly in line with the pouring lip of the crucible.

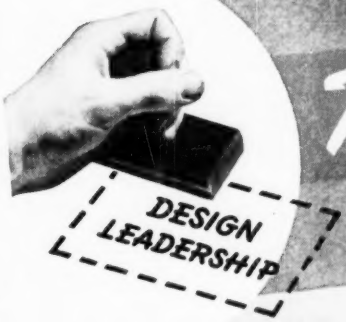
Mold is cooled in the furnace under argon or vacuum for one half to one hour, giving the titanium in the mold and crucible sufficient time to solidify and cool below the temperature at which it reacts with air contaminants.

Scope of Operations—Although experience to date has been based on use of split molds, there is no apparent reason why this process cannot use investment techniques. Small furnace at National Research is capable of castings weighing four or five pounds, but it is believed that good castings weighing as much as 100 pounds can be produced in larger furnaces. Casting finish is equivalent to that of good sand castings.

The equipment division of NRC is offering a 10-pound skull-melting furnace, similar to the one used for development.

Results of Physical and Chemical Tests

	Pure Titanium	4% Cr—2% Mo Alloy
Hardness, Rockwell A	60–63	65.5
Charpy impact, at room temperature, foot-pounds	11	8.4
Tensile strength, pounds per square inch	Not Available	129,000
Chemical analysis, weight percent		
Oxygen	0.1–0.2	0.3
Nitrogen	0.03	0.03–0.05
Carbon	0.08–0.15	0.1–0.15



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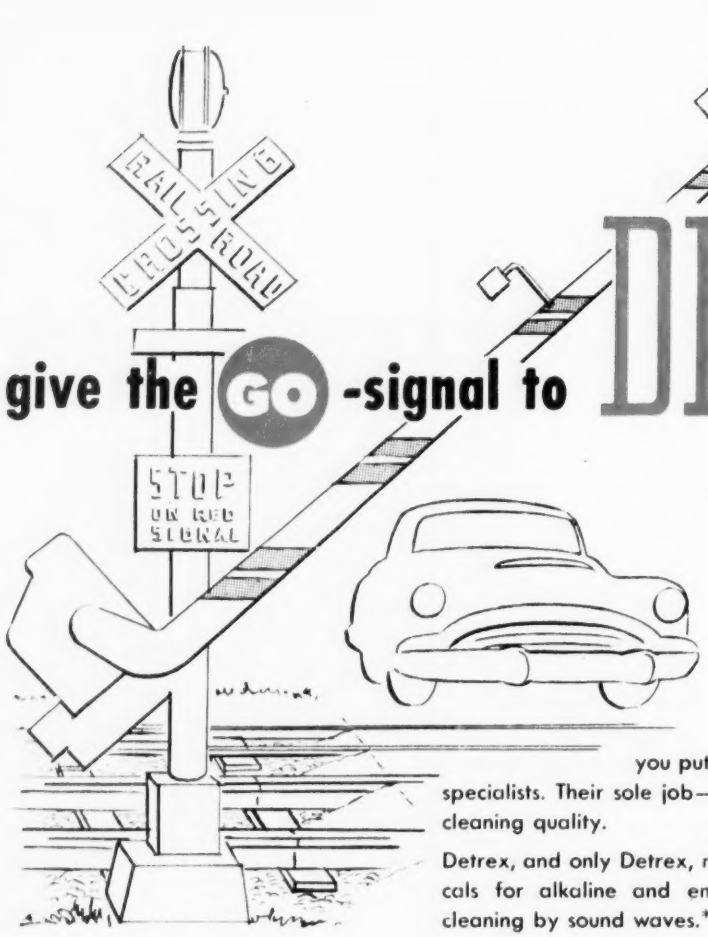

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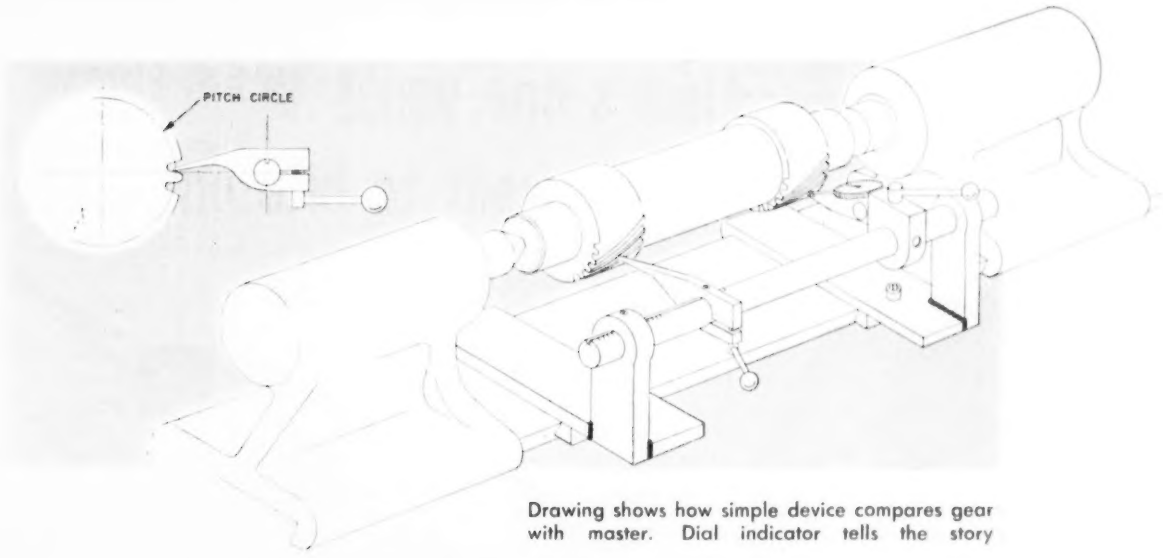

Drawing shows how simple device compares gear with master. Dial indicator tells the story

Homemade Checker Bridges Gap

Lead comparator for helical gears is fabricated in the tool-room. It's a stopgap device, designed to serve till the commercially-made comparator arrives

By FRANK M. BUTRICK JR.
Consulting Tool Engineer
Alma, Mich.

MACHINE DELIVERIES are still slow enough in some lines that many smaller firms may have to construct make-shifts with existing equipment until new machines arrive.

While a lead comparator for helical gears is hardly the sort of thing one would expect to reproduce in the tool-room, here is one instance in which just that happened.

Too Late—A Michigan firm secured a contract to make precision crown-shaved helical gears. Although the firm had made helical gears for years, crown shaving was causing problems because a lead comparator was necessary to check the helical angle of the hobbed gear and crown of the gear after it had been shaved.

A hurried search failed to reveal any good used comparators and delivery on a new one, which they ordered, couldn't be made till long after they had to be in production.

Stopgap—A temporary unit was designed around a Brown & Sharpe bench center. Entire practicability of design was based on the fact that the customer's inspection department could furnish two perfect master gears: One hobbed, to check the helix angle of the tooth; the other crown shaved, to check the crown of the tooth on production shaved gears.

With those two masters, all they required was an arbor to hold master gear and gear to be checked in alignment, while a tracer on the master and an indicator on the sample gave a comparison between the two.

Line Up—Gears are keyway-broached after hobbing and before shaving. Keyway is located from the teeth. Therefore, the arbor was ground to fit the broached hole in the gears and locate the master and sample gear in alignment from their respective keyways.

Inspection member consists of a round bar held parallel to, and level with, the gear arbor. This bar is allowed longitudinal movement but rotation is prevented by a keyway and set screw at one end. Tracing finger and an indicator are mounted on this bar.

Steps—Master gear and gear to be checked are mounted on the arbor, and arbor is placed between centers. Bar carrying the tracing finger and indicator is positioned in its supports so one of the lines at one end of the bar, spaced 0.1-inch apart, is in line with one side of the support.

Tracing finger is then moved along the bar until it makes contact with the tooth face just inside the edge of the gear, and locked in place. Correct relation between center of the gear, center of the bar, and point of contact between gear and tracing finger is maintained by a set screw on the tracing finger riding in the bar keyway.

With the master gear held lightly against the tracing finger by hand pressure on the arbor, the indicator is located on the corresponding edge of the tooth face of the gear to be checked, adjusted to read zero, and locked in place.

Comparing the two gears merely involves sliding the bar past the gears, maintaining sufficient pressure by hand on the arbor to assure contact with the tracer, and noting the indicator. Readings can be taken every 0.1-inch and permanently recorded.

Here's one you'll want to bite on! It's Formbrite

Upper lure is Formbrite. Lower one is made of ANACONDA Fancy Pattern Embossed Brass.

FISH find this particular line of brass spinners so attractive that fishermen's demands have built annual sales of the Aeroplane Tackle Manufacturing Company of Denver to more than two million lures of all types.

The high finish on the spinner is part of the secret. While the cost of producing this is of no interest to the fish, it is to the manufacturer. Recently all brass orders were changed to Formbrite*, the superior ANACONDA Drawing Brass that has enabled this firm to cut polishing costs over 25%, and on several stamped products to produce the required finish by tumbling only prior to lacquering or plating.

Formbrite, with its superfine grain, provides a surface far superior to ordinary drawing brass. It is stronger, harder, more scratch-resistant than ordinary brass, yet retains remarkable ductility for forming and drawing. It's a premium product at a non-premium price. If these features lure you, we should like to show you how this better brass can cut your product's finishing costs. Or write for Publication B-39 to *The American Brass Company, General Offices, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Limited, New Toronto, Ontario.*

Thirty-five years ago a fisherman, disgusted with his luck, cut up an old brass bait box to make himself a spinner resembling an old-time airplane propeller. Both fish and fisherman liked it so much, he started what is now a big and thriving business.

*Reg. U.S. Pat. Off.

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STEEL

December 28, 1953

Market Outlook

THE YEAR END brings business forecasts in dime-a-dozen quantities but you don't have to depend on a forecast to know how steel business will shape up in January.

The nature of steel production is such that orders have to be placed several weeks in advance of rolling. Consequently, the die for January business at the mill level is cast and buyers are thinking now about February and March.

OUTLOOK— Here's how the situation looks: January will be a somewhat better month than December, when holidays and inventory reductions at metal consuming plants took the edge off new buying. In February, demand will be stronger than in January. And March, historically a banner month in steel production, will be the best one in the first quarter.

LIQUIDATION IS KEY—Business as a whole is expected to be slightly lower in 1954 than in 1953, but the reason steel demand is expected to rise in the next three months over the level of late 1953 is that metal consumers are expected to complete their inventory liquidation soon. When they started to reduce inventories of raw materials they curtailed new buying. Confidence in an increased supply of steel made consumers believe they could get along with smaller stocks.

AN ACHILLES HEEL?—While the increased availability of steel and price concessions are adequate reasons for reducing steel inventories, lowered inventories could bring about a scramble for steel if a failure to get a Korean peace conference under way by late January flares into war again or if some other incident arouses buyers.

Pointing out that inventory reduction means being more vulnerable in event of sudden shortages, the National Association of Purchasing Agents says "this is no time to be overconfident and no time to toss an old supplier over for a 50-cent-a-ton price advantage. A long-range approach to assurance of supply demands a long-range policy, rather than one of expediency," the association suggests.

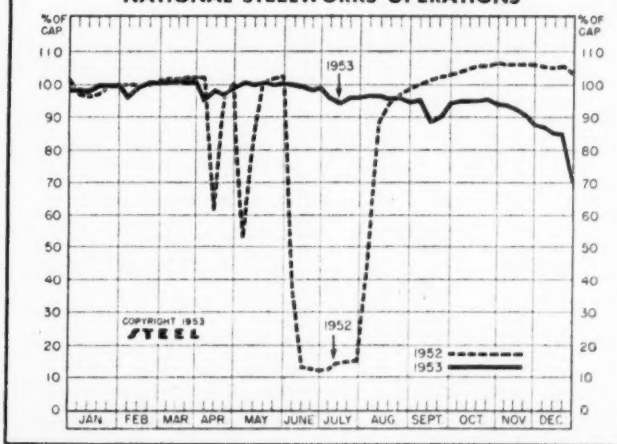
CLOSE TO THE VEST—In reducing inventories and buying close to the vest, steel buyers in some cases are canceling orders that are already in railroad cars for delivery. In other instances, consumers want delivery in three to four weeks, or from stock, or ahead of melt schedules.

EYES ON AUTOS— While watching the first quarter shape up, steel companies will be keeping a collective eye on sales of new models of automobiles. The automobile industry is the biggest single consumer of steel. Consequently, the public's acceptance of the new models will determine to a large degree how much steel will be made and sold in the next few months.

Although most forms of finished steel are in good supply, a couple still give procurement problems. They are structural shapes, particularly wide flange sections, and seamless pipe.

HOLIDAY FOR STEEL—The lowered general demand for steel prompted steel producers to reduce production during the Christmas holiday week for the first time in several years. STEEL's preliminary estimate of the national rate of output of ingots and steel for castings during the week ended Dec. 26 is 70 per cent of capacity, down 13.5 points from the preceding week.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended Dec. 26	Change	Same Week 1952	Same Week 1951
Pittsburgh	74.5	—15.5	102	97
Chicago	74	—20	109.5	96.5
Mid-Atlantic	71	—14	95	101.5
Youngstown	60	—22	106	106
Wheeling	61.5	—29.5	98	98.5
Cleveland	55	—25.5*	96	102.5
Buffalo	49	—39	104	104
Birmingham	80	+10	104	104
New England	76	+ 1	89	89
Cincinnati	67.5	— 5.5	90	77
St. Louis	64	—24	88.5	87
Detroit	67.5	—30.5*	104.5	104.5
Western	86	— 2	105	102
Estimated National Rate	70†	—13.5	103	101.5

*Change from preceding week's revised rate.
†Preliminary.
Weekly steelmaking capacity is estimated at 2 254,459 net tons in 1953; 2,077,040 tons in 1952; 1,999,034 tons in 1951.

The Metalworking Outlook—p. 19 Technical Outlook—p. 67

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Dec. 22

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400	Bars, H.R., stainless, 303 (lb)	$0.675	Strip, C.R., stainless, 430 (lb)	$0.415	Tin plate, hot-dipped, 1.25 lb	$8.433
Rails, light, 40 lb	5.767	Bars, H.R., alloy	0.418	Strip, H.R., carbon	4.975	Tin plate, electrolytic, 0.25 lb	7.133
Tie Plates	5.125	Bars, H.R., carbon	4.873	Pipe, black, buttweld (100 ft)	14.454	Black plate, can making quality	6.233
Axles, railway	7.250	Bars, reinforcing	4.750	Pipe, galv., buttweld (100 ft)	17.731	Wire, drawn, carbon	7.713
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, C.F., carbon	7.860	Pipe, line (100 ft)	141.980	Wire, drawn, stainless, 430 (lb)	0.545
Plates, carbon	4.550	Bars, C.F., alloy	11.075	Casing, oil well, carbon (100 ft)	149.516	Bale ties (bundle)	5.653
Structural Shapes	4.383	Bars, C.F., stainless, 302 (lb)	0.548	Casing, oil well, alloy (100 ft)	214.113	Nails, wire, 8d common	7.488
Bars, tool steel, carbon (lb)	0.415	Sheets, electrical	9.183	Tubes, boiler (100 ft)	‡	Wire, barbed (80-rod spool)	6.847
Bars, tool steel, alloy, oil hardening die (lb)	0.505	Strip, C.R., carbon	7.245	Tubing, mechanical, carbon (100 ft)	‡	Woven wire fence (20-rod roll)	16.174
Bars, tool steel, H.R. alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.135	Sheets, H.R., carbon	4.765	Tubing, mechanical, stainless, 304 (100 ft)	161.193		
Bars, tool steel, H.R. alloy, high speed W 18, Cr 4, V 1 (lb)	1.730	Sheets, C.R., carbon	5.904				
		Sheets, galvanized	6.845				
		Sheets, C.R., stainless, 302 (lb)	0.548				

‡ Not available.

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Dec. 22 1953	Dec. 15 1953	Month Ago	Nov. Average
(1947-1949=100)	141.5	141.5	141.4	141.4

STEEL's FINISHED STEEL PRICE INDEX

	Dec. 24 1953	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Index (1935-39 av.=100)	189.74	189.74	189.91	181.31	151.86
Index in cents per lb	5.140	5.140	5.145	4.912	4.114

STEEL's ARITHMETICAL PRICE COMPOSITE*

	Dec. 21 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Finished Steel, NT	$114.64	$114.64	$115.18	$110.98	$95.50
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	55.04	46.69
Basic Pig Iron, GT	56.04	56.04	56.04	54.86	46.29
Malleable Pig Iron, GT	57.27	57.27	57.27	55.77	47.41
Steelmaking Scrap, GT	31.33	32.00	34.67	43.00	42.25

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	Dec. 24 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.45
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	5.302	5.302	5.302	4.502	3.79
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.225	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.275
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, deld., Philadelphia	4.38	4.38	4.38	4.13	3.48
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Contesville, Pa.	4.35	4.35	4.35	4.35	3.75
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.55	4.55	4.55	4.35	3.95
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.275
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	4.425	4.425	4.425	3.75-4.225	3.275
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.25
Strip, C.R., Pittsburgh	5.45	5.45	5.45-5.95	5.10-5.80	4.375
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.00
Strip, C.R., Detroit	5.45-6.05	5.45-6.05	5.45-6.05	5.30-6.05	4.20
Wire, Basic, Pitts.	5.525	5.525	5.525	5.10-5.225	4.325
Nails, Wire, Pittsburgh	6.55	6.55	6.55	6.20-6.85	5.775
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$6.70

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$", Pitts.	4.525	4.525	4.525	4.425	3.775

PIG IRON, Gross Ton

	Dec. 24 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47.00
Basic, Valley	56.00	56.00	56.00	54.50	46.00
Basic, deld. Phila.	60.75	60.75	60.75	59.25	50.17
No. 2 Fdry, Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	55.00	46.25
No. 2 Fdry, Valley	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, deld. Phila.	61.25	61.25	61.25	59.75	50.67
No. 2 Fdry, Birm.	52.88	52.88	52.88	51.38	43.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	58.93	49.09
Malleable, Valley	56.50	56.50	56.50	55.00	46.50
Malleable, Chicago	56.50	56.50	56.50	55.00	46.50
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	228.00*	163.00*

*78-82% Mn, per gross ton, Etna, Pa. †74-76% Mn, per net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$32.50	$33.50	$35.50	$44.00	$42.75
No. 1 Heavy Melt, E. Pa.	31.00	31.00	35.00	41.50	45.25
No. 1 Heavy Melt, Chicago	30.50	31.50	33.50	42.50	41.75
No. 1 Heavy Melt, Valley	29.50	29.50	34.50	44.00	42.75
No. 1 Heavy Melt, Cleve.	29.50	29.50	32.50	43.00	42.25
No. 1 Heavy Melt, Buffalo	29.50	29.50	34.50	43.00	48.50
Rails, Rerolling Chicago	42.50	42.50	46.50	52.50	69.50
No. 1 Cast, Chicago	33.50	33.50	34.50	45.00	70.50

COKE, Net Ton

Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$14.50
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	17.00	17.00
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.40

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.50; No. 43, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 25.50-26.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $2.00 per lb deld.

Cobalt: 97.99%, $2.60 per lb for 550 lb keg; $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 29.50-30.00 deld. Conn. Valley, 29.625-30.125 deld. Midwest; Lake 30.00 deld; Fire refined 29.75 deld.

Germanium: 99.9%, $295 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $165-$175 per troy oz.

Lead: Common 13.30, chemical 13.40, corroding 13.40, St. Louis, New York basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8% standard ingots 27.00, 10,000 lb or more, f.o.b. Freeport, Tex. Sticks, 1.3 in. dia., 45.00, 100 to 4999 lb.

Magnesium Alloys: AZ91B 30.50; AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more.

DAILY NONFERROUS PRICE RECORD

	Price Dec. 24	Change	Previous Price	Nov. Avg.	Oct. Avg.	Dec. 1952 Avg.
Copper	29.50-30.00	Oct. 20	29.00-30.00	29.750	29.606	24.500
Lead	13.30	Sept. 16	13.80	13.300	13.300	13.925
Zinc	10.00	Sept. 11	10.50	10.000	10.000	12.500
Tin	84.25	Dec. 22	83.25	83.352	81.096	121.500
Nickel	60.00	Jan. 14	56.50	60.000	60.000	58.500
Aluminum	21.50	July 15	20.50	21.500	21.500	20.000
Magnesium	27.00	Mar. 9	24.50	27.000	27.000	24.500

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, common grade, deld. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, deld. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99+%, deld.; Magnesium, 99.8%, Freeport, Tex.

Mercury: Open market, spot, New York, $185-$188 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or ingots for addition to cast iron, 60.00; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $140-$150 per troy oz, nom.

Palladium: $22-$24 per troy oz.

Platinum: $91-$93 per troy oz. from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $75-$80 per troy oz.

Selenium: 99.5%, $4.25-$4.75 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, New York, 84.25.

Titanium: Sponge, 99.3+ %, $5 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $5.35 per lb f.o.b. shipping point; less than 1000 lb $5.50; 99+ % hydrogen reduced, $6.30. Treated ingots $10.43.

Zinc: Prime western 10.00, brass special 10.25, intermediate 10.50, E. St. Louis, freight allowed over 0.50 per pound. High grade 11.35, special high grade 11.50, die casting alloy ingot 14.50, deld.

Zirconium: Sponge $14.00 per lb; powder 100 lb or more $7.00; less than 100 lb $8.00.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston Alloys 20.75-21.75; No. 12 foundry alloy (No. 2 grade) 19.75-20.75; 5% silicon alloy, 0.60 Cu max., 22.75-23.50; 13 alloy, 0.60 Cu max., 22.75-23.50; 195 alloy 21.50-22.50; 108 alloy 20.75-21.75; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 21.00-22.00; grade 2, 20.00-21.00; grade 3, 18.75-19.75; grade 4, 17.25-18.25.

Brass Ingot: Red brass, No. 115, 24.50; tin bronze No. 225, 35.25, No. 245, 29.50; high-leaded tin bronze, No. 305, 28.75; No. 1 yellow, No. 405, 20.75; manganese bronze No. 421, 25.25.

Magnesium Alloy Ingot: AZ63A, $1.50; AZ91B, $1.50; AZ91C, $2.00; AZ92A, $1.50.

NONFERROUS MILL PRODUCTS

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb 36.28; 30,000 lb, 36.53; l.c.l., 37.03. Magnet wire deld., 15,000 lb or more 41.83; l.c.l., 42.53.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $18.50 per cwt; pipe, full coils $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 100,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forging billets, $6; hot-rolled and forged bars, $6.

ZINC

Sheets 23.00, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 19.00-20.50 f.o.b. mill, 36,000 lb and over. Plates 19.00-22.25.

	NICKEL, "A" Nickel	MONEL, Monel	INCONEL, Inconel
Sheet, C.R., ..	86.5	67.5	92.5
Strip, C.R. ...	92.5	70.5	98.5
Plate, H.R. ..	84.5	65.5	90.5
Rod, Shapes ..	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks ..	....	60.0	....

ALUMINUM

(30,000 lb base; freight allowed over 499 lb) Sheets and Circles: 2S and 3S mill finish c.l

Thickness Range, Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-48	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.2	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* 72-180 in. lengths. † 36 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. widths or dia., 72-240 in. lengths

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
50S-F	33.5	37.4
4S-F	34.5	39.1
52S-F	36.2	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* 24-48 in. widths or dia., 72-180 in. lengths

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	Round 11S-T3	Round 17S-T4	Hexagonal 11S-T3	Hexagonal 17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 42.00-32.76, in specific lengths 36-144 in., diameters 0.375-8 in.; rectangles and squares, Class 1, 49.2 to 37.6 in random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
¾	$15.05	2	$ 46.30
1	23.65	4	127.70
1¼	32.00	6	228.50
1½	38.25	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in 108.00, 0.064-in 81.00, 0.125-in 71.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled, AZ31, 53.00, 20,000 lb or more 0.188-1.0 in. thick, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 69.00, 20,000 lb or more, ¼-in. thick, widths 24-48 in., lengths 60-144 in.

Extrusion Stock: AZ31, Rectangles, ¾ x 2 in 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.98c	....	48.44	26.000	26.000	25.250
Yellow brass	41.72	41.66	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.376
Naval Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90%	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	59.43g	57.69	....	23.625	23.375	11.813
Phosphor Bronze, A, 5%	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
Muntz Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clipping 13.50; low copper clippings 13.50; mixed clippings 10.50; old sheet 10.50; borings and turnings 7.00; pistons and struts 7.50; crankcases 10.50; industrial castings 10.50.

Copper and Brass: Heavy copper and wire, No. 1 23.00-23.50; No. 2 copper 21.00-21.50; light copper 19.00-19.50; No. 1 composition red brass 17.00; No. 1 composition turnings 16.50; mixed brass turnings 10.50; new brass clippings 17.00-17.50; No. 1 brass rod turnings 12.00-12.50; light brass 10.00; heavy yellow brass 12.50-13.00; new brass rod ends 14.50; auto radiators, unsweated, 12.50; cocks and faucets 14.50-15.00; brass pipe 16.00.

Lead: Heavy 10.50; battery plate 5.50-5.75; linotype and stereotype 12.50; electrotype 11.00; mixed babbitt 12.00-12.50.

Magnesium: Clippings 20.00-21.00; clean castings 19.00-20.00; iron castings, not over 10% removable Fe, 18.00-19.00.

Monel: Clippings 24.00-26.00; old sheet 22.00-24.00; turnings 18.00-20.00; rods 24.00-26.00.

Nickel: Sheets and clips 70.00; rolled anodes 70.00; turnings 40.00; rod ends 70.00.

Tin: No. 1 pewter 40.00-45.00; block tin pipe 65.00-67.00; No. 1 babbitt 37.00-38.00.

Zinc: Old zinc, 3.50; new die cast scrap, 3.50; old die cast scrap, 3.25.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 14.00-14.50; 51S, 52S clippings 14.00-14.50; 14S, 17S, 24S clippings 13.00-13.50; mixed clippings 12.75-13.50; old sheet 11.00-11.50; old cast 11.00-11.50; clean old cable, free of steel, 14.00-14.50; borings and turnings 11.50-12.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 24.00-24.50; No. 2 copper 22.50; light copper 21.00; refinery brass (60% copper) per dry copper content 19.50; auto radiators, nominal.

INGOT MAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 25.00; No. 2 copper 23.50; light copper 22.00; No. 1 composition borings 18.00-18.50; No. 1 composition solids 18.50-19.00; heavy yellow brass solids 14.00-14.50; yellow brass turnings 12.75-13.25; radiators 14.00-14.50.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $2.15 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.035; 200-499 lb $1.02; 500-999 lb $1.015; 1000 lb or more $1.01.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 2000 lb 29.00; over 2000 lb 28.75.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 14.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 2500 oz and over 77.375.

Sodium Cyanide: Egg, under 1000 lb 19.80, 1000-19,900 lb 18.80, 20,000 lb and over 17.80; granular, add 1.0 premium to above.

Sodium Stannate: Less than 100 lb 67.2; 100-600 lb 55.2; 700-1900 lb 50.7; 2000-9900 lb 49; 10,000 lb or more 47.8.

Stannous Chloride (Anhydrous): Less than 50 lb $1.521; 50 lb $1.181; 100-300 lb $1.031; 400-900 lb $1.007; 1000-1900 lb 98.2; 2000-4900 lb 94.6; 5000-19,000 lb 88.5; 20,000 lb and over 82.4.

Stannous Sulphate: Less than 50 lb $1.223; 50 lb 92.3; 100-1900 lb 90.3; 2000 lb and over 88.3.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

Nonferrous Metals

Aluminum's gains impress copper companies so much that, one by one, they are bringing aluminum into their marketing act or becoming financially interested in it

IF YOU can't whip them, join them.

This old saw is finding application in nonferrous metals, where a long-standing and highly competitive battle for leadership is being waged between aluminum and copper. The copper companies are convinced aluminum is here to stay. One by one they're bringing aluminum into their marketing act.

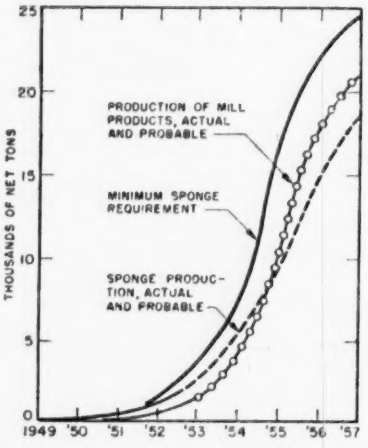
Newcomers—Anaconda Aluminum Co., subsidiary of the copper mining firm, over a year ago got a fast start in aluminum by announcing plans to build a $45 million reduction plant in Montana. Capacity is rated at 55,000 tons yearly and first production is scheduled for 1954. American Smelting & Refining Co. has been interested in aluminum since 1945 when it bid for government surplus aluminum plants, and it is rumored to be planning a move next year. It's already a sizable factor in secondary aluminum markets.

Kennecott Copper Corp., producer of a quarter of the free world's copper and nearly half of U. S. output, took a belated but smart $20-million plunge into aluminum last week. It bought 325,000 shares of preferred and 100,000 shares of common stock in Kaiser Aluminum & Chemical Corp., which Wall Streeters say represents a sizable minority block. Before the deal, Kaiser common stock ownership shaped up roughly this way: Henry J. Kaiser Co., 40.7 per cent; General Construction Co., 11.6 per cent; J. F. Shea Investment Co., 10 per cent, and Pacific Bridge Co., the remainder.

Rampant Rumors—Speculation on effects of the deal covers plenty of ground. All companies concerned are mum about details or ramifications. No one really believes the purchase was solely for investment purposes. Actually, Kennecott is said to be having its cake and eating it too—getting an assured source of supply without taking a flyer at producing aluminum itself. It can also gain valuable aluminum know-how and experience.

Chances of a merger in the near future are dim. Kennecott (total assets last year were $703.5 million, sales $477 million) is twice the size of Kaiser (total assets $318.9 million, sales $183 million), but the latter has the Henry J. Kaiser empire behind it. Financial dopesters say to watch for Kennecott representation in the aluminum company's directorship for clues on future developments. A safe bet is a surge in aluminum fabrication by Chase Brass & Copper Co., a Kennecott subsidiary. Cleveland, where Chase has two mills, is a likely spot for the job.

Titanium Production Pattern



While sponge production is expected to fall short of demand, the actual supply of mill products to customers should in great part close the gap as mill recovery improves and recycling of consumer scrap becomes commonplace.

Source: Titanium Metals Corp. of America

Prospects — Broad trend toward aluminum fabrication by brass companies has been gaining momentum in recent years. Industry will be able to buy many aluminum products from its normal brass mill sources before long as more and more brass mills add the light metal to their repertoire.

For many brass companies, aluminum is not new. Scovill Mfg. Co. rolled aluminum into commercial strip form back in 1889 and is now selling 2000-pound continuous coils. Revere Copper and Brass Co. today is the nation's largest nonintegrated fabricator of wrought aluminum, turning out impressive tonnages of extrusions, sheet, bar and tubing.

American Brass Co. is adding $2.5 million in aluminum rolling equipment to its Torrington, Conn., plant and is rolling experimentally in Waterbury. Anaconda Wire & Cable Co. uses both copper and aluminum. Bridgeport Brass Co. now produces extrusions and is adding a continuous welded tubing line. The company also is taking over the $25-million Air Force extrusion plant at Adrian, Mich., which Bohn Aluminum & Brass Corp. will cease operating next May.

Wanted: More Nickel

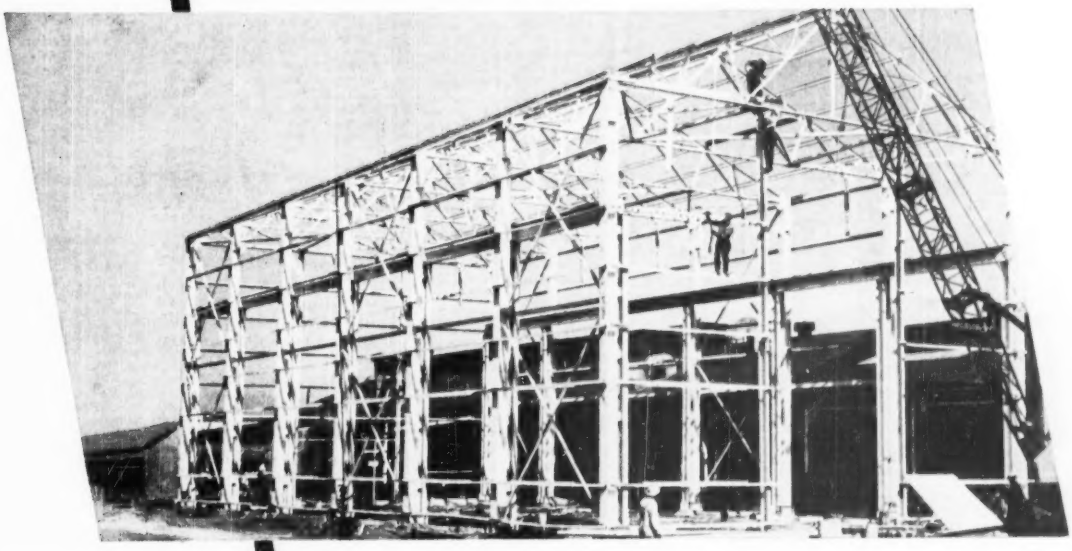
Additional nickel capacity is being sought by the government too. Shortages loom next year (see p. 27) and total needs might not be met until 1956 or beyond. General Services Administration has turned thumbs down on government help in building a custom nickel refinery because of developments in hydrometallurgical refining that may supplant pyrometallurgical processes.

GSA is known to be dickering with Nicaro to boost capacity by 10,500 tons and also with Freeport Sulphur Co. to put its proposed Moa Bay, Cuba, project into operation. Freeport's plant would produce about 15,000 tons of nickel and 1500 tons of cobalt yearly. Ore deposits (40 million tons) run 1.45 per cent nickel and 1.4 per cent cobalt, and are owned by Freeport. Process planned is different from anything being utilized today and a pilot plant is about to go into operation in Texas, concentrating on high temperature leaching with sulphuric acid rather than ammonia. Full-scale operations could not get under way before 1956 at earliest.

Nonferrous Briefs

- Price concessions in aluminum sheet and foil have been granted in recent weeks by a major producer.
- Watch for Dow Chemical Co.'s new mill at Madison, Ill., to be rolling aluminum as well as magnesium in the near future. Same facilities can be used for either.
- Conversion of the government's Longhorn tin smelter at Texas City, Tex., into a metallurgical laboratory under direction of the Bureau of Mines is urged by the Malayan Tin Bureau.
- Demand for cobalt is easing off because of nickel decontrol. Users are adding greater amounts of nickel and less cobalt to alloys.

MACHINE SHOP ADDITION



Plant additions are a cinch for Ingalls. Whether it's a new machine shop or foundry . . . or a completely new plant covering a dozen or more acres, Ingalls can not only fabricate the steel but also erect it . . . quickly, economically and to your own specifications.

The next time you figure on a plant addition, call one of Ingalls' conveniently located offices. Large or small . . . if it's steel, Ingalls can build it!

Fabricating Steel is Our Business

The INGALLS Iron Works Company

BIRMINGHAM, ALABAMA

Sales Offices: New York, Chicago, Pittsburgh, Houston
Plants: Birmingham, Ala.; Verona, Pa.; Pascagoula, Miss.; North Birmingham, Ala.; Decatur, Ala.

STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on page 99. Key to footnotes, page 101.

—SEMIFINISHED—

INGOTS, Carbon Forging (NT)
Fontana,Calif. K1 ....$86.00
Munhall,Pa. U5 .....59.00

INGOTS, Alloy (NT)
Detroit R7 .....$63.00
Fontana,Calif. K1 .....88.00
Midland,Pa. C18 .....62.00
Munhall,Pa. U5 .....62.00

BILLETS, BLOOMS & SLABS
Carbon Rerolling (NT)
Aliquippa,Pa. J5 ....$62.00
Bessemer,Pa. U5 .....62.00
Clairton,Pa. U5 .....62.00
Ensley,Ala. T2 .....62.00
Fairfield,Ala. T2 .....62.00
Fontana,Calif. K1 ....70.00
Gary,Ind. U5 .....62.00
Johnstown,Pa. B2 .....62.00
Lackawanna,N.Y. B2 ..62.00
Munhall,Pa. U5 .....62.00
So.Chicago,Ill. U5 ....62.00
So.Duquesne,Pa. U5 ...62.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$75.50
Bessemer,Pa. U5 .....75.50
Buffalo R2 .....75.50
Canton,O. R2 .....75.50
Clairton,Pa. U5 .....75.50
Cleveland R2 .....75.50
Conshohocken,Pa. A3 ..82.50
Detroit R7 .....78.50
Ensley,Ala. T2 .....75.50
Fairfield,Ala. T2 .....75.50
Fontana,Calif. K1 ....83.50
Gary,Ind. U5 .....75.50
Geneva,Utah C11 .....75.50
Houston S5 .....83.50
Johnstown,Pa. B2 .....75.50
Lackawanna,N.Y. B2 ..75.50
LosAngeles B3 .....94.50
Munhall,Pa. U5 .....75.50
Seattle B3 .....94.50
So.Chicago R2, U5, W14 .75.50
So.Duquesne,Pa. U5 ..75.50
So.SanFrancisco B3 ...94.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$82.00
Buffalo R2 .....82.00
Canton,O. R2, T7 ....82.00
Conshohocken,Pa. A3 ..89.00
Detroit R7 .....84.00
Fontana,Calif. K1 ....101.00
Gary,Ind. U5 .....82.00
Houston S5 .....90.00
Ind.Harbor,Ind. Y1 ...82.00
Johnstown,Pa. B2 .....82.00
Lackawanna,N.Y. B2 ..82.00
LosAngeles B3 .....102.00
Massillon,O. R2 .....82.00
Midland,Pa. C18 .....82.00
Munhall,Pa. U5 .....82.00
So.Chicago R2, U5, W14 .82.00
So.Duquesne,Pa. U5 ...82.00
Struthers,O. Y1 .....82.00
Warren,O. C17 .....82.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$92.50
Canton,O. R2 .....92.50
Cleveland R2 .....92.50
Fontana,Calif. K1 ....113.50
Gary,Ind. U5 .....92.50
Massillon,O. R2 .....92.50
So.Chicago,Ill. R2 ....92.50
So.Duquesne,Pa. U5 ..92.50

SHEET BAR (NT)
Fontana,Calif. K1 ....$93.18

SKELP
Aliquippa,Pa. J5 .....3.85
Munhall,Pa. U5 .....3.75
Warren,O. R2 .....3.75
Youngstown R2, U5 ....3.75

WIRE RODS
AlabamaCity,Ala. R2 ..4.525
Aliquippa,Pa. J5 .....4.525
Alton,Ill. L1 .....4.70
Buffalo W12 .....4.525
Cleveland A7 .....4.525
Donora,Pa. A7 .....4.525
Fairfield,Ala. T2 .....4.525
Fontana,Calif. K1 ....5.325
Houston S5 .....4.925
Johnstown,Pa. B2 .....4.525
Joliet,Ill. A7 .....4.525
KansasCity,Mo. S5 ....4.865
LosAngeles B3 .....5.325
Minnequa,Colo. C10 ...4.775
Moneasen,Pa. P7 .....4.725
No.Tonawanda,N.Y.B11 4.525
Pittsburg,Calif. C11 ...5.175
Portsmouth P12 .....4.525
Roebling,N.J. R5 .....4.625
So.Chicago,Ill. R2 ....4.525
SparrowsPoint,Md. B2 .4.625
Sterling,Ill.(1) N15 ...4.525
Struthers,O. Y1 .....4.525
Torrance,Calif. C11 ...5.325
Worcester,Mass. A7 ...4.825

—STRUCTURALS—

Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Bessemer,Ala. T2 .....4.10
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 .....4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2 ....4.10
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 ....4.70
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.80
Minnequa,Colo. C10 ....4.55
Munhall,Pa. U5 .....4.10
Niles,Calif. P1 .....4.80
Phoenixville,Pa. P4 ....4.15
Seattle B3 .....4.85
So.Chicago,Ill. U5, W14 4.10
So.SanFrancisco B3 ....4.75
Torrance,Calif. C11 ....4.80
Weirton,W.Va. W6 .....4.35

Wide Flange
Bethlehem,Pa. B2 .....4.15
Clairton,Pa. U5 .....4.10
Fontana,Calif. K1 .....5.30
Lackawanna,N.Y. B2 ..4.15
Munhall,Pa. U5 .....4.10
Phoenixville,Pa. P4 ....4.95
So.Chicago,Ill. U5 .....4.10

Alloy Stand. Shapes
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....6.40
Gary,Ind. U5 .....5.00
Munhall,Pa. U5 .....5.00
So.Chicago,Ill. U5 .....5.00

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....6.175
Bessemer,Ala. T2 .....6.175
Bethlehem,Pa. B2 .....6.20
Clairton,Pa. U5 .....6.175
Fairfield,Ala. T2 .....6.175
Fontana,Calif. K1 .....6.825
Gary,Ind. U5 .....6.175
Geneva,Utah C11 .....6.175
Ind.Harbor,Ind. I-2 ...6.175
Ind.Harbor,Ind. Y1 ....6.675
Johnstown,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ..6.20
LosAngeles B3 .....6.85
Munhall,Pa. U5 .....6.175
Seattle B3 .....6.90
So.Chicago,Ill. U5, W14 6.175
So.SanFrancisco B3 ....6.80
Struthers,O. Y1 .....6.675

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....6.20
Lackawanna,N.Y. B2 ..6.20
Munhall,Pa. U5 .....6.125
So.Chicago,Ill. U5 ....6.125

BEARING PILES
Munhall,Pa. U5 .....4.10
So.Chicago,Ill. U5 .....4.10

—PILING—

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ...4.925
Lackawanna,N.Y. B2 ..4.925
Munhall,Pa. U5 .....4.925
So.Chicago,Ill. U5 ....4.925

—PLATES—

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..4.10
Aliquippa,Pa. J5 .....4.10
Ashland,Ky. (15) A10, ..4.10
Bessemer,Ala. T2 .....4.10
Clairton,Pa. U5 .....4.10
Claymont,Del. C22 .....4.20
Cleveland J5, R2 .....4.10
Coatesville,Pa. L7 .....4.20
Conshohocken,Pa. A3 ..4.25
Ecorse,Mich. G5 .....4.30
Fairfield,Ala. T2 .....4.10
Fontana,Calif.(30) K1 ..4.75
Gary,Ind. U5 .....4.10
Geneva,Utah C11 .....4.10
GraniteCity,Ill. G4 .....4.30
Harrisburg,Pa. C5 .....4.10
Houston S5 .....4.50
Ind.Harbor,Ind. I-2, Y1 4.10
Johnstown,Pa. B2 .....4.10
Lackawanna,N.Y. B2 ..4.10
Minnequa,Colo. C10 ....4.95
Munhall,Pa. U5 .....4.10
Pittsburgh J5 .....4.10
Riverdale,Ill. A1 .....4.10
Seattle B3 .....5.00
Sharon,Pa. S3 .....4.10
So.Chicago,Ill. U5, W14 4.10
SparrowsPoint,Md. B2 ..4.10
Steubenville,O. W10 ....4.10
Warren,O. R2 .....4.10
Weirton,W.Va. W6 ....4.10
Youngstown R2, U5, Y1 4.10

PLATES, Carbon Abras. Resist.
Fontana,Calif. K1 .....5.90
Geneva,Utah C11 .....5.25

PLATES, Wrought Iron
Economy,Pa. B14 .....9.30

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.25
Bessemer,Ala. T2 .....6.25
Clairton,Pa. U5 .....6.25
Cleveland J5 .....6.25
Conshohocken,Pa. A3 ..6.25
Ecorse,Mich. G5 .....6.45
Fairfield,Ala. T2 .....6.25
Fontana,Calif (30) K1..6.95
Gary,Ind. U5 .....6.25
Geneva,Utah C11 .....6.25
Ind.Harbor,Ind. I-2 ....6.25
Ind.Harbor,Ind. Y1 ....6.75
Johnstown,Pa. B2 .....6.25
Lackawanna,N.Y. B2 ..6.25
Munhall,Pa. U5 .....6.25
Pittsburgh J5 .....6.25
Seattle B3 .....7.15
Sharon,Pa. S3 .....6.25
So.Chicago,Ill. U5, W14 6.25
SparrowsPoint,Md. B2 ..6.25
Youngstown U5 .....6.25
Youngstown Y1 .....6.75

PLATES, Alloy
Claymont,Del. C22 ....5.55
Coatesville,Pa. L7 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Johnstown,Pa. B2 .....5.55
Munhall,Pa. U5 .....5.55
Sharon,Pa. S3 .....5.55
So.Chicago,Ill. U5, W14 5.55
SparrowsPoint,Md. B2 ..5.55

FLOOR PLATES
Cleveland J5 .....5.15
Conshohocken,Pa. A3 ...5.15
Harrisburg,Pa. C5 .....5.15
Ind.Harbor,Ind. I-2 ....5.15
Munhall,Pa. U5 .....5.15
So.Chicago,Ill. U5 .....5.15

PLATES, Ingot Iron
Ashland,c.l. (15) A10 ..4.35
Ashland,l.c.l.(15) A10 ..4.85
Cleveland, c.l. R2 .....4.70
Warren,O. c.l. R2 .....4.70

—BARS—

BARS, Hot-Rolled Carbon
Aliquippa,Pa. J5 .....4.15
Alton,Ill. L1 .....4.35
Atlanta,Ga. A11 .....4.40
Bessemer,Ala. T2 .....4.15
Buffalo(31) R2 .....4.18
Clairton,Pa. U5 .....4.15
Cleveland(31) R2 .....4.21
Detroit R7 .....4.30
Ecorse,Mich. G5 .....4.35
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 .....4.85
Gary,Ind. U5 .....4.15
Gadsden,Ala.(31) R2 ...4.18
Houston S5 .....4.55
Ind Harbor,Ind. I-2, Y1.4.15
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 .....4.75
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.60
Niles,Calif. P1 .....4.85
N Tonawanda,N.Y. B11.4.15
Pittsburg,Calif. C11 ...4.85
Pittsburgh J5 .....4.15
Portland,Oreg. O4 .....4.90
Seattle B3, N14 .....4.90
So.Chicago U5, W14 ....4.15
Chicago(31) R2 .....4.22
So.Duquesne,Pa. U5 ....4.15
So.SanFran.,Calif. B3..4.90
Sterling,Ill.(1) N15 ....4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Weirton,W.Va. W6 ....4.15
Youngstown U5 .....4.15
Youngstown(31) R2 ....4.20

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....4.875
Buffalo R2 .....4.875
Canton,O. R2, T7 ....4.875
Clairton,Pa. U5 .....4.875
Detroit R7 .....4.975
Ecorse,Mich. G5 .....5.075
Fairless,Pa. U5 .....5.025
Fontana,Calif. K1 .....5.925
Gary,Ind. U5 .....4.875
Houston S5 .....5.275
Ind.Harbor,Ind. I-2, Y1 4.875
Johnstown,Pa. B2 ....4.875
KansasCity,Mo. S5 .....5.475
Lackawanna,N.Y. B2..4.875
LosAngeles B3 .....5.925
Massillon,O. R2 .....4.875
Midland,Pa. C18 .....4.875
So.Chicago R2, U5,W14 4.875
So.Duquesne,Pa. U5 ..4.875
Struthers,O. Y1 .....4.875
Warren,O. C17 .....4.875
Youngstown U5 .....4.875

BARS & SMALL SHAPES, H.R.
High-Strength Low-Alloy
Aliquippa,Pa. J5 ....6.225
Bessemer,Ala. T2 .....6.225
Bethlehem,Pa. B2 .....6.225
Clairton,Pa. U5 .....6.225
Ecorse,Mich. G5 .....6.425
Fairfield,Ala. T2 .....6.225
Fontana,Calif. K1 ....7.475
Gary,Ind. U5 .....6.225
Ind.Harb.,Ind. Y1 ....6.725
Ind.Harb.,Ind. I-2 ....6.225
Johnstown,Pa. B2 .....6.225
Lackawanna,N.Y. B2 ..6.225
LosAngeles B3 .....6.925
Pittsburgh J5 .....6.225
Seattle B3 .....6.975
So.Chicago W14 .....6.225
So.Duquesne,Pa. U5 ..6.225
So.SanFrancisco B3 ..6.975
Struthers,O. Y1 .....6.725
Youngstown U5 .....6.225

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....4.35

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....4.15
Atlanta A11 .....4.40
Niles,Calif. P1 .....4.85
SanFrancisco S7 .....5.10

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 ....6.00
Gary,Ind. U5 .....5.00
Houston S5 .....5.60
KansasCity S5 .....5.60
Youngstown U5 .....5.00

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....5.20
BeaverFalls,Pa. M12, R2 5.20
Buffalo B5 .....5.25
Camden,N.J. P13 .....5.65
Carnegie,Pa. C12 .....5.20
Chicago W18 .....5.20
Cleveland A7, C20 ....5.20
Detroit P17, R7 .....5.35
Detroit B5 .....5.40
Donora,Pa. A7 .....5.20
Elyria,O. W8 .....5.20
FranklinPark,Ill. N5 ..5.20
Gary,Ind. R2 .....5.20
GreenBay,Wis. F7 .....5.20
Hammond,Ind. L2, M13 5.20
Hartford,Conn. R2 ....5.75
Harvey,Ill. B5 .....5.20
LosAngeles R2 .....6.65
Mansfield,Mass. B5 ....5.75
Massillon,O. R2, R8 ..5.20
Monaca,Pa. S17 .....5.20
Newark,N.J. W18 .....5.65
NewCastle,Pa. (17) B4 .5.20
Pittsburgh J5 .....5.20
Plymouth,Mich. P5 ....5.45
Putnam,Conn. W18 ....5.75
Readville,Mass. C14 ....5.75
St.Louis,Mo. M5 .....5.50
So.Chicago,Ill. W14 ....5.20
SpringCity,Pa. K3 .....5.65
Struthers,O. Y1 .....5.20
Waukegan,Ill. A7 .....5.20
Worcester,Mass. W19 ...6.10
Youngstown F3, Y1 ....5.20

BARS, Cold-Finished Carbon
(Turned and Ground)
Cumberland,Md. (5) C19 4.45

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....6.325
BeaverFalls,Pa. M12 ..6.325
Bethlehem,Pa. B2 ....6.325
Buffalo B5 .....6.325
Camden,N.J. P13 .....6.50
Canton,O. R2, T7 ....6.325
Carnegie,Pa. C12 .....6.325
Chicago W18 .....6.325
Cleveland A7, C20 ....6.325
Detroit R7 .....6.425
Detroit P17 .....6.475
Detroit B5 .....6.525
Donora,Pa. A7 .....6.325
Elyria,O. W8 .....6.325
Gary,Ind. R2 .....6.325
Hammond,Ind. L2, M13 6.325
Hartford,Conn. R2 ....6.775
Harvey,Ill. B5 .....6.325
Lackawanna,N.Y. B2..6.325
Mansfield,Mass. B5 ..6.775
Massillon,O. R2, R8 ..6.325
Midland,Pa. C18 .....6.325
Monaca,Pa. S17 .....6.325
Newark,N.J. W18 .....6.65
Plymouth,Mich. P5 ....6.525
So.Chcigo,Ill. R2, W14 6.325
SpringCity,Pa. K3 .....6.50
Struthers,O. Y1 .....6.325
Warren,O. C17 .....6.325
Waukegan,Ill. A7 .....6.325
Worcester,Mass. A7 ...6.625
Youngstown F3, Y1 ....6.325

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..4.15
Atlanta A11 .....4.40
Buffalo R2 .....4.15
Cleveland R2 .....4.15
Emeryville,Calif. J7 ....4.90
Fairfield,Ala. T2 .....4.15
Fairless,Pa. U5 .....4.30
Fontana,Calif. K1 ....4.85
Gary,Ind. U5 .....4.15
Houston S5 .....4.55
Ind.Harbor,Ind. I-2, Y1 4.15
Johnstown,Pa. B2 .....4.15
KansasCity,Mo. S5 .....4.75
Lackawanna,N.Y. B2 ..4.15
LosAngeles B3 .....4.85
Milton,Pa. M18 .....4.15
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....4.85
Pittsburg,Calif. C11 ....4.85
Pittsburgh J5 .....4.15
SandSprings,Okla. S5 ..5.00
Seattle B3, N14 .....4.90
So.Chicago,Ill. R2 .....4.15
So.Duquesne,Pa. U5 ....4.15
So.SanFrancisco B3 ....4.15
SparrowsPoint,Md. B2..4.15
Sterling,Ill. (1) N15 ...4.15
Struthers,O. Y1 .....4.15
Torrance,Calif. C11 ....4.85
Youngstown R2, U5 ....4.15

BARS, Reinforcing
(Fabricated; to consumers)
Johnstown, ¼-1" B2 ..5.55
KansasCity S5 .....6.35
LosAngeles B3 .....5.80
Marion,O. P11 .....5.55
Seattle N14 .....5.80
Seattle B3 .....5.85
So.SanFrancisco B3 ....5.85
SparrowsPt. ½-1" B2..5.55
Williamsport,Pa. S19 ..5.45

RAIL STEEL BARS
Axis Pa. 1-Is 4.25
ChicagoHts.(3,4) C2 ....4.15
Chicago Hts.(3,4) I-2 ....4.00
FortWorth Tex (26) T4..4.65
Franklin,Pa.(3,4) F5 ....4.15
Marion,O.(3) P11 .....4.25
Moline,Ill.(3) R2 .....4.25
Tonawanda(3,4) B12 ...5.00
Williamsport,Pa.(3) S19.4.50
Williamsport,Pa.(4) S19 5.45

BARS, Wrought Iron
Economy,Pa.(S.R.) B14 10.40
Economy,Pa.(D.R.)B14 12.90
Economy(Staybolt) B14 13.20
Mc.K.Rks.(S.R.) L5 ..10.40
Mc.K.Rks.(D.R.) L5 ..14.00
McK.Rks.(Staybolt) L5 15.50

—SHEETS—

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ..3.925
Allenport,Pa. P7 .....3.925
Ashland,Ky.(8) A10 ..3.925
Butler,Pa. A10 .....3.925
Cleveland J5, R2 .....3.925
Conshohocken,Pa. A3 ..4.05
Detroit M1 .....4.15
Ecorse,Mich. G5 .....4.125
Fairfield,Ala. T2 .....3.925
Fairless,Pa. U5 .....4.025
Fontana,Calif. K1 ....4.70
Gary,Ind. U5 .....3.925
Geneva,Utah C11 .....4.025
GraniteCity,Ill. G4 .....4.125
Ind.Harbor,Ind. I-2, Y1 3.925
Irvin,Pa. U5 .....3.925
Kokomo,Ind. C16 .....4.025
Lackawanna,N.Y. B2 ..3.925

Munhall,Pa. U5 .....3.925
Newport,Ky. N9 .....3.925
Niles,O. N12 .....5.175
Pittsburg,Calif. C11 ..4.625
Pittsburgh J5 .....3.925
Portsmouth,O. P12 ....3.925
Riverdale,Ill. A1 .....3.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ...3.925
SparrowsPoint,Md. B2..3.925
Steubenville,O. W10 ..3.925
Torrance,Calif. C11 ...4.625
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ...3.925
Youngstown U5, Y1 ..3.925

SHEETS, H.R. (19 gage)
AlabamaCity, Ala. R2..5.225
Dover O R1 .....5.05
Kokomo,Ind. C16 ....5.025
Mansfield,O. E6 .....5.05
Niles,O. N12 .....4.775
Torrance,Calif. C11 ...5.875

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy
Cleveland J5, R2 .....5.90
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.10
Fairfield,Ala. T2 .....5.90
Fontana,Calif. K1 ....6.675
Gary,Ind. U5 .....5.90
Ind.Harbor,Ind. I-2 ....5.90
Ind.Harbor,Ind. Y1 ....6.40
Irvin,Pa. U5 .....5.90
Lackawanna(35) B2 ...5.90
Munhall,Pa. U5 .....5.90
Pittsburgh J5 .....5.90
Sharon,Pa. S3 .....5.90
So.Chicago,Ill. U5 .....5.90
SparrowsPoint(36) B2..5.90
Warren,O. R2 .....5.90
Weirton,W.Va. W6 ....5.90
Youngstown U5 .....5.90
Youngstown Y1 .....6.40

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)
Ashland,Ky.(8) A10 ..4.175
Cleveland R2 .....4.525
Ind.Harbor,Ind. I-2 ..4.175
Warren,O. R2 .....4.525

SHEETS, Cold-Rolled Steel (Commercial Quality)
Allenport,Pa. P7 .....4.775
Butler,Pa. A10 .....4.775
Cleveland J5, R2 .....4.775
Ecorse,Mich. G5 .....4.975
Fairfield,Ala T2 .....4.775
Fairless,Pa. U5 .....4.875
Follansbee,W.Va. F4 ..4.775
Fontana,Calif. K1 ....5.875
Gary,Ind. U5 .....4.775
GraniteCity,Ill. G4 ....4.975
Ind.Harbor,Ind. I-2,Y1 4.775
Irvin,Pa. U5 .....4.775
Lackawanna,N.Y. B2 ..4.775
Middletown,O. A10 ....4.775
Pittsburg,Calif. C11 ...5.725
Pittsburgh J5 .....4.775
Portsmouth,O. P12 ....4.775
SparrowsPoint,Md. B2.4.775
Steubenville,O. W10 ...4.775
Warren,O. R2 .....4.775
Weirton,W.Va. W6 ....4.775
Youngstown Y1 .....4.775

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 .....7.225
Ecorse,Mich. G5 .....7.425
Fontana,Calif. K1 ....8.275
Gary,Ind. U5 .....7.225
IndianaHarbor,Ind. Y1.7.725
Irvin,Pa. U5 .....7.225
Lackawanna(37) B2 ..7.225
Pittsburgh J5 .....7.225
SparrowsPoint (38) B2 7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225
Youngstown Y1 .....7.725

SHEETS, Cold-Rolled Ingot Iron
Butler,Pa. A10 .....5.275
Cleveland R2 .....5.375
Middletown O A10 ....5.275
Warren,O. R2 .....5.375

SHEETS, Gal'd No. 10 Steel
AlabamaCity,Ala. R2..5.275
Ashland,Ky. (8) A10 ..5.275
Canton,O. R2 .....5.275
Delphos,O. N16 .....5.775
Dover,O. R1 .....5.275
Fairfield,Ala. T2 ....5.275†
Gary,Ind. U5 .....5.275†
GraniteCity,Ill. G4 ....5.475
Ind.Harbor,Ind. I-2 ...5.325
Irvin,Pa. U5 .....5.275†
Kokomo,Ind.(13) C16..5.375
MartinsFerry,O. W10 ..5.275
Niles,O. N12 .....5.275
Pittsburg,Calif. C11 ..6.025†
SparrowsPoint,Md. B2.5.275
Steubenville,O. W10 ..5.275
Torrance,Calif. C11 ..6.275†
Weirton,W.Va. W6 ....5.275

†Based on 5c zinc.

SHEETS, Galvanized No. 10 High-Strength Low-Alloy
Irvin,Pa. U5 .....7.925
SparrowsPoint(39) B2 .8.075

SHEETS, Galvanized Ingot Iron No. 10 flat
Ashland,Ky.(8) A10 ..5.525
Canton,O. R2 .....6.025

SHEETS, Culvert	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.325	....
Canton,O. R2	....6.475	6.925
Fairfield, Ala. T2	....6.075	6.325
Gary,Ind. U5	....6.075	6.325
Ind.Harbor I-2	..6.075	6.325
Irvin,Pa. U5	...6.075	6.325
Kokomo,Ind. C16	6.175	....
MartinsFry.,O.W10	6.075	....
Pitts.,Cal. C11	..6.825	....
SparrowsPt. B2	6.075	....
Torrance,Cal. C11	7.075	....

SHEETS, Culvert	Pure Iron
Ashland,Ky A10	.....6.575
Fairfield, Ala. T2	....6.325
MartinsFerry,O. W10	..6.325

SHEETS, Galvannealed Steel
Canton,O. R2 .....5.825
Irvin,Pa. U5 .....5.825†
Kokomo,Ind.(13) C16..5.925
Niles,O. N12 .....5.825

†Based on 5c zinc

SHEETS, ZINCGRIP Steel
Butler,Pa. A10 .....5.525
Middletown,O. A10 ....5.525

SHEETS, ZINCGRIP Ingot Iron
Butler,Pa. A10 .....5.775
Middletown,O. A10 ....5.775

SHEETS, Electrogalvanized
Cleveland R2 (28) 6.125
Niles,O. R2 (28) 6.125
Weirton,W.Va. W6 ....5.975

SHEETS, ALUMINIZED
Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron
Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.175
Gary,Ind. U5 .....5.175
GraniteCity,Ill. G4 ..5.875
Ind.Harbor,Ind. I-2 ...5.175
Irvin,Pa. U5 .....5.175
Middletown,O. A10 ....5.175
Niles,O. N12 .....6.525
Youngstown Y1 .....5.175

BLUED STOCK, 29 ga.
Follansbee,W.Va. F4 ..7.30
Follansbee (23) F4 ...7.175
Yorkville,O. W10 .....7.20

SHEETS, Long Terne Steel (Commercial Quality)
BeechBott'm,W.Va.W10 5.675
Gary,Ind. U5 .....5.675
Mansfield,O. E6 .....5.675
Middletown,O. A10 ....5.675
Niles,O. N12 .....5.675
Weirton,W.Va. W6 ...5.675

SHEETS, Long Terne, Ingot Iron
Middletown,O. A10 ....6.075

SHEETS, Well Casing
Fontana,Calif. K1 ....6.20

—STRIP—

STRIP, Hot-Rolled Carbon
Ala.City,Ala.(27) R2 .3.925
Allenport,Pa. P7 .....3.925
Alton,Ill. L1 .....4.10
Ashland,Ky.(8) A10 ..3.925
Atlanta A11 .....4.175
Bessemer,Ala. T2 ....3.925
Bridgeport,Conn.(10)S15 4.15
Buffalo (27) R2 .....3.925
Butler,Pa. (8) A10 ...3.925
Carnegie,Pa. S18 ....4.425
Conshohocken,Pa. A3 ..4.05
Detroit M1 .....4.15
Ecorse,Mich. G5 .....4.125
Fairfield,Ala. T2 ....3.925
Fontana,Calif. K1 .....4.70
Gary,Ind. U5 .....3.925
Houston,Tex. S5 .....4.325
Ind.Harbor,Ind. I-2,Y1 3.925
Johnstown,Pa.(25) B2 .3.925
KansasCity,Mo.(9) S5 4.525
Lackw'na,N.Y.(25) B2..3.925
LosAngeles(25) B3 ....4.675
Milton,Pa. M18 .....3.925
Minnequa,Colo. C10 ..5.025
NewBritain(10) S15 ....4.15
N.Tonawanda,N.Y.B11 3.925
Pittsburg,Calif. C11 ...4.675
Portsmouth,O. P12 ....3.925
Riverdale,Ill. A1 .....3.925
SanFrancisco S7 .....5.10
Seattle(25) B3 .....4.925
Seattle N14 .....4.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ...3.925
So.SanFrancisco(25)B3 4.675
SparrowsPoint,Md. B2 3.925
Torrance,Calif. C11 ...4.675
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ....3.925
Youngstown U5 .....3.925

STRIP, Hot-Rolled Alloy
Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.40
Fontana,Calif. K1 .....7.80
Gary,Ind. U5 .....6.40
Houston,Tex. S5 .....6.80
KansasCity,Mo. S5 7.00
LosAngeles B3 .....7.60
NewBritn.,Conn.(10)S15 6.45
Sharon,Pa. S3 .....6.40
So.Chicago W14 .....6.40
Youngstown U5 .....6.40

STRIP, Hot-Rolled High-Strength Low-Alloy
Bessemer,Ala. T2 .....5.95
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....5.95
Fontana,Calif. K1 ....7.05
Gary,Ind. U5 .....5.95
Ind.Harbor,Ind. I-2 ....5.95
Ind.Harbor,Ind. Y1 ....6.45
Lackawanna,N.Y. B2 ..6.00
LosAngeles(25) B3 ....6.70
Seattle(25) B3 .....6.95
Sharon,Pa. S3 .....5.95
So.SanFrancisco(25) B3..6.70
SparrowsPoint,Md. B2..6.00
Warren,O. R2 .....5.95
Weirton,W.Va. W6 ....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

STRIP, Hot-Rolled Ingot Iron
Ashland,Ky.(8) A10 ..4.175
Warren,O. R2 .....4.525

STRIP, Cold-Rolled Carbon
Anderson,Ind. G6 .....5.45
Bridgeprt,Conn. (10)S15 5.75
Butler,Pa. A10 .....5.45
Cleveland A7, J5 .....5.45
Dearborn,Mich. D3 ....5.65
Detroit P20 .....5.70
Detroit D2, M1 .....5.65
Dover,O. G6 .....5.45
Ecorse,Mich. G5 .....5.65
Follansbee,W.Va. F4 ...5.45
Fontana,Calif. K1 ....7.35
FranklinPark,Ill. T6 ...5.70
Ind.Harbor,Ind. I-2 ....5.70
Lackawanna,N.Y. B2 ..5.45
LosAngeles C1 .....7.50
Mattapan,Mass. T6 ....6.30
Middletown,O. A10 ....5.45
NewBedford,Mass. R10 .6.00
NewBritain(10) S15 ...5.75
NewCastle,Pa. B4, E5..5.45
NewHaven,Conn. A7 ....6.20
N.Wilmgtn,Conn. D2 ...5.90
Pawtucket,R.I. R3 6.30
Pawtucket,R.I. N8 ....6.30
Pittsburgh J5 .....5.45
Riverdale,Ill. A1 .....5.70
Rome,N.Y.(29) R6 .....5.45
Sharon,Pa. S3 .....5.45
SparrowsPoint,Md. B2 ..5.45
Trenton,N.J. R5 .....7.00
Wall'ford,Conn. W2 ...6.20
Warren,O.(40) T5 .....5.45
Warren,O. B9, R2 .....5.45
Weirton,W.Va. W6 ....5.45
Worcester,Mass. W19 ...7.05
Worcester,Mass. A7 ....6.30
Youngstown C8 .....5.95
Youngstown Y1 .....5.45

STRIP, Cold-Rolled Alloy Steel
Bridgeprt,Conn.(10)S15 12.15
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....12.00
Dover,O. G6 .....12.00
Fontana,Calif. K1 ....13.65
Harrison,N.J. C18 ....12.00
NewBritn,Conn.(10)S15 12.15
Pawtucket,R.I.(11) N8 12.15
Pawtucket,R.I.(12) N8 12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ...12.30
Youngstown C8 .....12.00

STRIP, Cold-Rolled High-Strength Low-Alloy
Cleveland J5 .....7.80
Cleveland A7 .....8.15
Dearborn,Mich. D3 ....7.90
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.35
Lackawanna,N.Y. B2 ..8.15
Pittsburgh J5 .....7.80
Sharon,Pa. S3 .....7.65
SparrowsPoint,Md. B2 ..8.15
Warren,O. R2 .....7.60
Weirton,W.Va. W6 ....8.15
Youngstown Y1 .....8.30

STRIP, Cold-Rolled Ingot Iron
Warren,O. R2 .....6.05

STRIP, Electrogalvanized
Dover,O. G6 .....5.45
Warren,O. B9, T5 .....5.45
Weirton,W.Va. W6 ....5.45
Youngstown C8 .....5.70

TIGHT COOPERAGE HOOP
Atlanta A11 .....4.65
Riverdale,Ill A1 .....4.50
Sharon,Pa. S3 .....4.35
Youngstown U5 .....4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co. Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div. H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Madart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman & Scott
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod.Steel Strip Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanely Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 StainlessWeldedProducts
S26 Specialty Wire Co. Inc.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W.Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet & Tube

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Beren,O. C7	...	8.00	8.60	10.55	12.85
Bridgeport,Conn.(10) B15	5.75	7.65	8.60	10.55	12.85
Bristol,Conn. W1	...	...	8.90	10.85	....
Carnegie,Pa. B15	....	7.65	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Dearborn,Mich. D3	5.65	7.85	8.80	....	....
Detroit D2	5.65	7.85	8.45	10.55	....
Dover,O. G6	5.45	7.65	8.60	10.55	12.85
FranklinPark,Ill. T6	5.80	7.80	8.75	10.70	....
Harrison,N.J. C18	....	...	8.90	10.85	13.15
Mattapan,Mass. T6	6.30	7.95	8.90	10.85	13.15
NewBritn.,Conn.(10) B15	5.75	7.65	8.60	10.55	12.85
NewCastle,Pa. B4	5.45	7.65	8.60	....	....
NewCastle,Pa. E5	5.45	8.00	8.60	10.55	12.85
NewHaven,Conn. D2	5.90	7.95	8.55	10.65	....
NewYork W3	...	7.95	8.90	10.85	13.15
Pawtucket,R.I. N8:					
Cleve.orPitts.Base	...	7.65	8.60	10.55	12.85
Worcester,Mass.,Base	6.65	7.95	8.90	10.85	13.15
Sharon,Pa. S3	5.45	7.65	8.60	10.55	12.85
Trenton,N.J. R5	...	7.95	8.90	10.85	13.15
Wallingford,Conn. W2	6.20	7.95	8.90	10.85	13.15
Warren,O. T5	5.45	7.65	8.60	10.55	12.85
Weirton,W.Va. W6	5.45	7.65	8.60	10.55	12.85
Worcester,Mass. A7	6.30	7.95	8.90	10.85	13.15
Worcester,Mass. T6	6.30	7.95	8.90	10.85	13.15
Youngstown C8	...	7.65	8.60	10.55	12.85
Spring Steel (Tempered)					
Buffalo W12	...	....	12.50	....	....
Bristol,Conn. W1	...	....	12.50	15.00	....
FranklinPark,Ill. T6	...	....	12.50	15.00	18.00
Harrison,N.J. C18	...	....	12.50	15.00	18.00
NewYork W3	...	....	12.50	15.00	18.00
Trenton,N.J. R5	...	....	12.50	15.00	18.00
Worcester,Mass. T6	...	....	12.50	15.00	18.00
Worcester,Mass. W12	...	....	12.50	....	....
Youngstown C8	...	....	12.50	15.00	18.00

SILICON STEEL

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (cut lengths ½c lower)	Field	Arma-ture	Electric	Motor	Dyna-mo
BeechBottom W10 (cut lengths)	...	...	8.35	9.60	10.40
Brackenridge,Pa. A4	...	...	8.85	10.10	10.90
GraniteCity,Ill. G4 (cut lengths)	...	....	8.55	9.80	....
IndianaHarbor,Ind. I-2	8.05	8.35	8.85	(34)	....
Mansfield,O. E6 (cut lengths)	7.55	7.85	8.35	9.60	10.40
Newport,Ky. N9 (cut lengths)	...	7.85	8.35	9.60	10.40
Niles,O. N12 (cut lengths)	7.55	7.85	8.35	....	....
Vandergrift,Pa. U5	...	8.35	8.85	10.10	10.90
Warren,O. R2	8.05	8.35	8.85	10.10	10.90
Zanesville,O. A10	...	8.35	8.85	10.10	10.90

SHEET, SILICON (22 Ga. Base) COILS (Cut Lengths ½c lower)	Transformer Grade 72	65	58	52
BeechBottom W10 (cut lengths)	10.95	11.50	12.20	13.00
Brackenridge,Pa. A4	11.45	....	....	....
Newport,Ky. N9 (cut lengths)	10.95	....	....	....
Vandergrift,Pa. U5	11.45	12.00	12.70	13.50
Warren,O. R2	11.45	....	....	....
Zanesville,O. A10	11.45	12.00	12.70	13.50

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	16.05	16.55
Vandergrift,Pa. U5	14.00	14.85	15.85	16.35

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	7.65	8.05
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American 1.25 1.50 Coke (Base Box)	lb	lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	8.95
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)	
Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.10

MANUFACTURING TERNES (Special Coated)	
Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)	
Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb	
Yorkville,O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)	
Gary,Ind. U5	9.75

—WIRE—

WIRE, Manufacturers Bright, Low Carbon	
AlabamaCity,Ala. R2	.5.525
Aliquippa,Pa. J5	.5.525
Alton,Ill. L1	.5.70
Atlanta A11	.5.725
Bartonville,Ill. K4	.5.625
Buffalo W12	.5.525
Chicago W13	.5.525
Cleveland A7, C20, R2	.5.525
Crawfordsville,Ind. M8	.5.625
Donora,Pa. A7	.5.525
Duluth,Minn. A7	.5.525
Fairfield,Ala. T2	.5.525
Fostoria,O. (24) S1	.5.75
Houston S5	.5.925
Johnstown,Pa. B2	.5.525
Joliet,Ill. A7	.5.525
KansasCity,Mo. S5	.6.125
Kokomo,Ind. C16	.5.625
LosAngeles B3	.6.475
Minnequa,Colo. C10	.5.775
Monessen,Pa. P7	.5.525
No.Tonawanda B11	.5.525
Palmer,Mass. W12	.5.825
Pittsburg,Calif. C11	.6.475
Portsmouth,O. P12	.5.525
Rankin,Pa. A7	.5.525
So.Chicago,Ill. R2	.5.525
So.SanFrancisco C10	.6.475
SparrowsPoint,Md. B2	.5.625
Sterling,Ill. (1) N15	.5.525
Struthers,O. Y1	.5.525
Waukegan,Ill. A7	.5.525
Worcester,Mass. A7	.5.825

WIRE, MB Spring, High Carbon	
Aliquippa,Pa. J5	6.925
Alton,Ill. L1	7.10
Bartonville,Ill. K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa. A7	6.925
Duluth,Minn. A7	6.925
Fostoria,O. S1	6.925
Johnstown,Pa. B2	6.925
LosAngeles B3	7.875
Millbury,Mass.(12) N6	7.225
Minnequa,Colo. C10	7.175
Monessen,Pa. F7	6.925
Monessen,Pa. P16	6.925
Muncie,Ind. I-7	7.225
Palmer,Mass. W12	7.225
Pittsburg,Calif. C11	7.875
Portsmouth,O. P12	6.925
Roebling,N.J. R5	7.225
So.Chicago,Ill. R2	6.925
So.SanFran. C10	7.875
SparrowsPt.,Md. B2	7.025
Struthers,O. Y1	6.925
Trenton,N.J. A7	7.225
Waukegan,Ill. A7	6.925
Worcester A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring	
Aliquippa,Pa. J5	6.625
Alton,Ill. L1	6.80
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa. A7	6.625
Duluth,Minn. A7	6.625
Johnstown,Pa. B2	6.625
LosAngeles B3	7.575
Minnequa,Colo. C10	*6.80*
Monessen,Pa. P7, P16	6.625
NewHaven,Conn. A7	6.925
Palmer,Mass. W12	6.925
Pittsburg,Calif. C11	7.575
Portsmouth,O. P12	6.625
Roebling,N.J. R5	6.925
So.Chicago,Ill. R2	6.625
So.SanFrancisco C10	7.575
SparrowsPoint,Md. B2	6.725
Trenton,N.J. A7	6.925
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925

WIRE, Fine & Weaving (8" Coils)	
Alton,Ill. L1	10.75
Bartonville,Ill. K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland A7	10.55
Crawfordsville,Ind. M8	10.55
Fostoria,O. S1	10.55
Johnstown,Pa. B2	10.55
Kokomo,Ind. C16	10.55
Minnequa,Colo. C10	10.30
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Roebling,N.J. R5	10.85
So.SanFrancisco C10	10.90
Waukegan,Ill. A7	10.55
Worcester,Mass. A7, T6	10.85

WIRE, Galv'd ACSR for Cores	
Bartonville,Ill. K4	9.50
Buffalo W12	9.50
Johnstown,Pa. B2	9.50
Minnequa,Colo. C10	9.625
Monessen,Pa. P16	9.50
Muncie,Ind. I-7	9.70
Roebling,N.J. R5	9.80
SparrowsPt.,Md. B2	9.66

ROPE WIRE	(A)
Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo W12	9.35
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.35
Monessen,Pa. P7, P16	9.35
Muncie,Ind. I-7	9.55
Palmer,Mass. W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.65
SparrowsPt. B2	9.45
Struthers,O. Y1	9.35
Worcester J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead	
Alton,Ill. L1	12.75
Bartonville,Ill. K4	12.65
Monessen,Pa. P16	12.55
Roebling,N.J. R5	12.85

WIRE, Cold-Rolled Flat	
Anderson,Ind. G6	7.45
Buffalo W12	7.45
Cleveland A7	7.45
Crawfordsville,Ind. M8	7.55
Dover,O. G6	7.45
Fostoria,O. S1	7.45
Kokomo,Ind. C16	7.55
FranklinPark,Ill. T6	7.60
Massillon,O. R8	7.45
Monessen,Pa. P16	*7.45*
Monessen,Pa. P7	7.45
Pawtkt.R.I.(12) N8	7.75
Trenton,N.J. R5	7.75
Worcester A7, T6, W12	7.75

WIRE, Merchant Quality (6 to 8 gage)	An'ld. Galv.
Ala.City R2	6.675 7.075**
Aliquippa J5	6.675 7.20*
Atlanta A11	6.775 7.30
Bartonville(19)K4	6.675 7.225
Buffalo U12	6.675 7.075†
Cleveland A7	6.675 ....
CrawfordsvilleM8	6.775 7.325
Donora,Pa. A7	6.675 7.075†
Duluth,Minn. A7	6.675 7.075†
Fairfield T2	6.675 7.075†
Houston,Tex. S5	7.075 7.475
JohnstownB2(48)	6.675 7.225*
Joliet,Ill. A7	6.675 7.075†
KansasCity,Mo.S5	7.275 7.675
Kokomo C16	6.775 7.175
LosAngeles B3	7.625 ....
Minnequa C10	6.925 7.375**
Monessen P7(48)	6.675 7.225
Palmer W12	6.975 7.375†
Pitts.,Calif. C11	7.625 8.025†
Rankin A7	6.675 7.075†
So.Chi'go R2	6.675 7.075**
S.S.Frn.(48)C10	7.625 8.025**
Spar'swPt.B2(48)	6.775 7.325*
Steri'g(1)(48) N15	6.675 7.20
Struthers,O. Y1	6.675 7.175
Worcester A7	6.975 ....

* Based on 10c zinc; † 5c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	149
Atlanta A11	151
Bartonville,Ill.(19) K4	149
Crawfordsville,Ind. M8	151
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
KansasCity,Mo. S5	161
Kokomo,Ind. C16	151
Minnequa,Colo. C10	154
Pittsburg,Calif. C11	173
So.Chicago, Ill. R2	149
So.SanFran.,Calif. C10	173
SparrowsPoint,Md. B2	151
Sterling,Ill.(1) N15	149

WOVEN FENCE, 9-15½ Ga.	Col.
Ala.City,Ala. R2	140**
Ala.City 17 ga. R2	235**
Ala.City 18 ga. R2	245**
Aliq'ppa,Pa.9-14½ga. J5	143*
Atlanta A11	145
Bartonville,Ill.(19) K4	143
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140†
Duluth,Minn. A7	140†
Fairfield,Ala. T2	140†
Houston,Tex. S5	148
Johnstown,Pa. B2	143
Johnstown 17 ga., 6"B2	234
Johnstown 4" B2	237
Joliet,Ill. A7	140†
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142
Minnequa,Colo. C10	148**
Monessen,Pa. 9 ga. P7	145
Pittsburg,Calif. C11	163†
Rankin,Pa. A7	140†
So.Chicago,Ill. R2	140**
Sterling,Ill. (1) N15	143

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

WIRE, Barbed	Col.
AlabamaCity R2	153**
Aliquippa J5	150*
Atlanta A11	158
Bartonville,Ill. (19) K4	156
Crawfordsville,Ind. M8	159
Donora,Pa. A7	153†
Duluth,Minn. A7	153†
Fairfield,Ala. T2	153†
Houston,Tex. S5	161
Johnstown,Pa. B2	156*
Joliet,Ill. A7	153
KansasCity,Mo. S5	165
Kokomo,Ind. C16	155
Minnequa,Colo. C10	159**
Monessen,Pa. P7	157
Pittsburg,Calif. C11	173†
Rankin,Pa. A7	153†
So.Chicago,Ill. R2	153**
S.SanFrancisco C10	176**
SparrowsPoint,Md. B2	158*
Sterling,Ill. (1) N15	*156*

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

WIRE, (16 gage)	An'ld. Galv. Stone	Galv. Stone
Ala.City R2	12.50	14.05**
Aliquippa J5	12.50	14.30*
Bartonville(19)K4	10.73	12.51
Buffalo W12	12.50	....
Cleveland A7	12.50	....
Crawfordsville M8	12.50	14.35
Fostoria,O. S1	12.60	14.15
Johnstown B2	12.50	14.35*
Kokomo C16	12.60	14.15
Minnequa C10	12.75	14.45**
Palmer,Mass.W12	12.50	14.05†
Pitts.,Calif. C11	12.85	14.40†
SparrowsPt. B2	12.60	14.45*
Sterling(1) N15	*12.50*	*14.30*
Waukegan A7	12.50	14.05†
Worcester A7	12.80	....

* Based on 11c zinc; †5c zinc; ** Subject to zinc equalization extras.

NAILS, Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	131
Aliquippa,Pa. J5	131
Atlanta A11	*133*
Bartonville,Ill. (19) K4	131
Chicago,Ill. W13	131
Cleveland A9	137
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Galveston,Tex. D7	139
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	136
Monessen,Pa. P7	131
Pittsburg,Calif. C11	150
Rankin,Pa. A7	131
So.Chicago,Ill. R2	131
SparrowsPt.,Md. B2	133
Sterling,Ill. (1) N15	131
Worcester,Mass. A7	137

NAILS, Cut (100 lb keg) To dealers (33)	
Conshohocken,Pa. A3	$8.00
Wheeling,W.Va. W10	8.00

STAPLES, Polished, Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	133
Aliquippa,Pa. J5	133
Atlanta A11	135
Bartonville,Ill. (19) K4	133
Crawfordsville,Ind. M8	135
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Johnstown,Pa. B2	133
Joliet,Ill. A7	133
Kokomo,Ind. C16	135
Minnequa,Colo. C10	138
Monessen,Pa. P7	133
Pittsburg,Calif. C11	152
Rankin,Pa. A7	133
So.Chicago,Ill. R2	133
SparrowsPt.,Md. B2	135
Sterling,Ill. (1) N15	133
Worcester,Mass. A7	139

—FENCE POSTS—

	Col.
ChicagoHts.,Ill. C2, I-2	145
Duluth,Minn. A7 (49)	145
Franklin,Pa. F5	145
Johnstown,Pa. B2	146
Marion,O. P11	145
Minnequa,Colo. C10	150
Moline,Ill. R2	145
So.Chicago,Ill. R2	145
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	158

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25
Ambridge, Pa. N2 (†)	15.75	...	19.75	...	22.25	...	23.75	...	23.75	...	23	...	25.5	...
Lorain, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.5	23	8.75	25.5	11.25
Youngstown Y1 (††)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25

ELECTRIC WELD STANDARD PIPE, Theaded and Coupled

Carload discounts from list, %

Youngstown R2 (**)	15.75	0.75	19.75	3	22.25	5.5	23.75	7	23.75	7	23	6.25	25.5	8.75

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	⅛		¼		⅜		½		⅝		¾		1		1¼		1½	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c		27.5c		27.5c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73		2.73	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	...	...	....	...	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5		
Alton, Ill. L1 (§)	...	...	....	...	....	....	24.25	9	27.25	13	29.75	16.5	32.25	17.5	32.75	18.25		
Benwood, W. Va. W10(††)	25.5	+0.25	17.75	+5.5	10.25	+10	26.25	11	29.25	15	31.75	18.5	34.25	19.5	34.75	20.25		
Butler, Pa. F6 (†)	26.5	+2.75	19.5	+7.25	12.5	+13	....	..	....	..	....	....	....	....	....	....		
Etna, Pa. N2 (†)	...	...	....	...	....	....	26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25		
Fontana, Calif. K1 (§)	...	...	....	...	....	....	13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5		
Ind. Harbor Y1 (††)	...	...	....	...	....	....	25.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5		
Lorain, O. N3 (*)	...	...	....	...	....	....	26.25	16	29.25	20	31.75	23.5	34.25	23	34.76	24		
Sharon, Pa. S4 (‡)	26.5	—0.25	19.50	+4.25	12.5	+8.5	....	..	....	..	....	....	....	....	....	....		
Sharon, Pa. M6	...	...	....	...	....	....	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25		
Sparrows Pt., Md. B2 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5		
Youngstown R2 (**)	...	...	....	...	....	....	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25		
Youngstown Y1 (††)	...	...	....	...	....	....	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5		
Wheatland, Pa. W9 (§)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5		

Size—Inches	2		2½		3		3½		4	
List Per Ft	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....
Alton, Ill. L1 (§)	33.25	18.75	34.75	18	34.75	18	....	....	....	....
Benwood, W.Va. W10(††)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Etna, Pa. N2 (†)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
Fontana, Calif. K1 (§)	22.25	7	23.75	7	23.75	7	....	....	....	....
Ind. Harbor, Ind. Y1 (††)	34.25	19	35.75	19	35.75	19	....	....	....	....
Lorain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	....	....	....	....
Sharon, Pa. M6	35.25	20.75	36.75	20.5	36.75	20.5	....	....	....	....
Sparrows Pt., Md. B2 (§)	32.25	18	34.75	18	34.75	18	25.75	8.5	25.75	8.5
Youngstown R2 (**)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Youngstown Y1 (††)	35.25	20	36.75	20	36.75	20	....	....	....	....
Wheatland, Pa. W9 (‡)	35.25	20	36.75	20	36.75	20	....	....	....	....

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 11c to under 12c; (*), 5c; (§), 10c to under 11c; (††), 10.50c-11.50c; with discounts adjusted on prices of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollar per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	21.31	18.44
1¼	13	....	25.24	18.12
1½	13	23.12	27.89	20.01
1¾	13	26.84	32.37	23.66
2	13	30.08	36.28	26.51
2¼	13	34.18	41.23	29.86
2½	12	37.10	44.75	32.41
2½	12	40.51	48.86	35.70
2¾	12	43.85	52.90	38.86
3	12	45.92	55.39	41.23

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	Std. Tee Rails All No. 2	60 lb Under
Bessemer,Pa. U5	4.325	4.225	4.275	5.20
Ensley,Ala. T2	4.325	4.225	....	5.20
Fairfield,Ala. T2	....	....	....	5.20
Gary,Ind. U5	4.325	4.225	4.275	...
Huntington,W.Va. W7	....	....	....	5.20
Indiana Harbor,Ind. I-2	4.325	4.225	4.275	
Johnstown,Pa. B2	....	....	...(16)	5.20
Lackawanna,N.Y. B2	4.325	4.225	....	5.20
Minnequa,Colo. C10	4.325	4.125	....	5.70
Steelton,Pa. B2	4.325	4.225	....	...
Williamsport,Pa. S19	....	....	....	5.20

TIE PLATES	
Fairfield,Ala. T2	5.125
Gary,Ind. U5	5.125
Ind.Harbor,Ind. I-2	5.125
Lackawanna,N.Y. B2	5.125
Minnequa,Colo. C10	5.125
Pittsburg,Calif. C11	5.275
Seattle B3	5.275
Steelton,Pa. B2	5.125
Torrance,Calif. C11	5.275

TRACK BOLTS (20) Treated	
KansasCity,Mo. S5	11.00
Lebanon,Pa. B2	11.00
Minnequa,Colo. C10	11.00
Pittsburgh O3, P14	11.00

JOINT BARS	
Bessemer,Pa. U5	5.275
Fairfield,Ala. T2	5.275
Ind.Harbor,Ind. I-2	5.275
Joliet,Ill. U5	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Steelton,Pa. B2	5.275

AXLES	
Ind.Harbor,Ind. S13	6.50
Johnstown,Pa. B2	6.50

STANDARD TRACK SPIKES	
Ind.Harbor,Ind. I-2, Y1	7.05
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.05
Minnequa,Colo. C10	7.05
Pittsburgh J5	7.05
Seattle B3	7.55
So.Chicago,Ill. R2	7.05
Struthers,O. Y1	7.05
Youngstown R2	7.05

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 8.90c
⅞-in. under ..... 26.5 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	4
⅝-in. & ¾-in.	5
⅞-in. and larger	3
Longer than 6 in.:	
All diams.	+4
Lag bolts, all diams.:	
6 in. and shorter	12
Over 6 in. long	8
Ribbed Necked Carriage	5
Blank	25
Plow	25
Step, Elevator, Tap and Sleigh Shoe	12
Tire Bolts	List
Boiler & Fitting-Up Bolts	23

NUTS

H.P. & C.P., regular & heavy: Square, all sizes	58
H.P.; Hex, regular & heavy:	
¾" and smaller	58
⅞" to 1⅛", inclusive	60
1¼" to 1½", inclusive	62
1⅝" and larger	58
C.P. Hex, regular heavy: All sizes	58
Hot Galv. Nuts (all types):	
¾" and smaller	40
⅞" to 1½", inclusive	43
Finished Hex Nuts:	
New standard, all sizes	58
Semifinished & Slotted Hex.:	
Regular and heavy, all sizes	58

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter	34
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼-in. diam. & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	47.5 & 10
Plated finishes	30 x 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	38
¾-in. through 1 in.	22
Longer than 6 in.:	
⅝-in. and smaller	20
¾-in. through 1 in.	7

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛" to 1.7/16"; 1.7/16" to 1.15/16" 4.58c; 1.15/16" to 7.5/16" 4.95c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 5.40c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; add 0.35c for universal mill.
(31) Base; deld. within mill county.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" and narrower.
(39) 48" and narrower.
(40) Lighter than 0.935"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(48) 6.7 gage.
(49) T post; deduct 2 cols. for U post.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98+% Fe, annealed	18.00
Unannealed	14.50
Swedish, c.i.f. N.Y., c.l., in bags	11.25
Electrolytic iron:	
Annealed, 99.6% Fe	42.50
Unannealed (99+% Fe)	36.50
Unannealed (99+% Fe) (minus 325 mesh)	53.50
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Atomized, 500 lb drums, freight allowed:	
Carlots	31.00
Ton lots	34.00
Antimony, 500 lb lots	32.00*
Brass, 20-ton lots	29.25-36.50
Bronze, 10-ton lots	51.00-60.00
Copper:	
Electrolytic	13.50*
Reduced	13.50*
Lead	7.50*
Magnesium	75.00-85.00
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel unannealed	89.50
Nickel-Silver 5-ton lots	47.00
Silicon	43.50
Solder	8.50*
Stainless Steel, 302	91.00
Tin	14.00*
Zinc, 10-ton lots	17.50-25.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	5.35
Less than 1000 lb	5.50
Chromium, electrolytic 99.9% Cr min.	3.60

*Plus cost of metal.

STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes; H.R. & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	46.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	46.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	48.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
304L	....	....	36.75	....	....	42.75	45.25	54.25	49.00
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	55.25	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	63.50	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	55.00	55.50	59.00	64.50	66.50
316L	....	....	52.50	....	....	61.00	64.25	70.00	72.00
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	78.00	80.25
321	22.75	29.50	35.25	40.75	42.00	42.00	46.00	55.50	54.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	60.75	59.25
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	49.25	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	44.00	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	33.75	38.25	53.00	39.50	40.75	59.75	71.00
501	....	....	14.00	14.50	21.25	16.00	18.25	30.50	29.00
502	....	....	15.25	16.00	22.25	17.00	20.00	51.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co., Sharon Steel Corp.; Shenango Agaloy Tube Co.; Simonds Saw & Steel Co., Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%	Sheets, Copper Base Both Sides
302	....	31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	41.00	.....	144.00
316	32.60	37.70-42.75	42.75	....
318	37.00	42.20	.....	....
321	29.30	34.40-37.00	37.00	111.00
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.60	.....	....
410	22.90	30.10	.....	....
430	22.90	30.10	.....	....
Inconel	41.23	54.18	.....	165.00
Nickel	37.50	50.90	.....	....
Monel	38.90	51.80	.....	....
Copper*	....	.....	46.00	....

	Strip, Carbon Base, Cold-Rolled 10%	Strip, Carbon Base, Cold-Rolled Both Sides	Strip, Carbon Base, Hot-Rolled 10%	Strip, Carbon Base, Hot-Rolled Both Sides
Copper*	27.85	35.85	24.00	32.25

*Deoxidized. Production points: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates Coatesville L7; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25-.285	5% Cr Hot Work	0.39
Extra Carbon	0.30-.340	W-Cr Hot Work	0.41
Special Carbon	0.35-.360	V-Cr Hot Work	0.43
Oil Hardening	0.370-.39	Hi-Carbon-Cr.	0.665-.70

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.055
18.25	4.25	1	4.75	...	2.340
18	4	2	9	...	2.565-2.695
18	4	2	....	...	1.820
18	4	1	....	...	1.580-1.660
13.5	4	3	....	...	1.875
6.4	4.5	1.9	....	5	1.065
6	4	3	....	6	1.300
2	1.4	1.2	....	...	0.495
1.5	4	1	....	8.5	0.895

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

PIG IRON, Gross Ton

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	....	....
Woodward,Ala. W15	52.38	52.88	56.50†	....
Cincinnati, deld.	....	60.43	....	....
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	....
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No.Tonawanda,N.Y. T9	....	56.50	57.00	....
Boston, deld.	66.65	67.15	67.65	....
Rochester,N.Y., deld.	59.02	59.52	60.02	....
Syracuse,N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
Muskegon,Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron,O., deld. from Cleve.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
New York, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Philadelphia, deld.	60.75	61.25	61.75	62.25
Birdsboro,Pa. B10	58.00	58.50	....	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Troy,N.Y. R2	58.00	58.50	59.00	....
Pittsburgh District				
Neville Island,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Ambridge, Aliquippa, deld	57.37	57.87	57.87	58.37
McKeesRocks, deld.	57.04	57.54	57.54	58.04
Lawrenceville,Homestead, Wilmerding,Monaca, deld.	57.66	58.16	58.16	58.66
Verona,Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....
Monessen,Pa P7	56.00	....	....	....
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	59.50	63.00	63.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T3	....	....	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos. southern grade. †Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$67.00
Buffalo H1	68.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

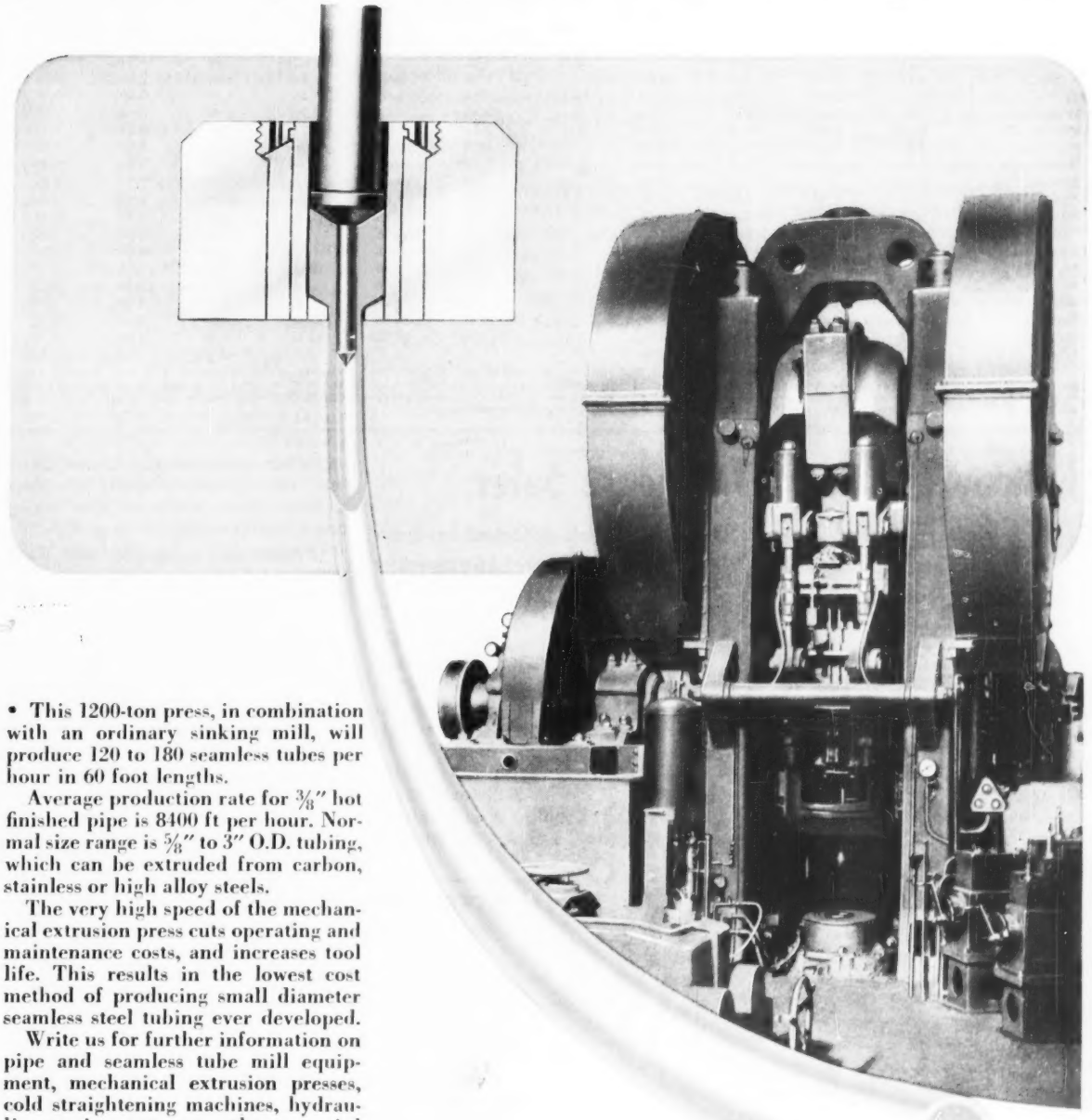
NiagaraFalls,N.Y. P15	$91.00
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	95.50
Keokuk, OH & Fdry, 12½ lb pigiets, 16% Si, frt. allowed K2	98.50
Wenatchee,Wash. OH & Fdry, freight allowed K2	95.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$61.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, deld.	67.55
Troy,N.Y. R2	64.00

MECHANICAL EXTRUSION PRESS

produces up to 180 seamless tubes per hour



• This 1200-ton press, in combination with an ordinary sinking mill, will produce 120 to 180 seamless tubes per hour in 60 foot lengths.

Average production rate for 3/8" hot finished pipe is 8400 ft per hour. Normal size range is 5/8" to 3" O.D. tubing, which can be extruded from carbon, stainless or high alloy steels.

The very high speed of the mechanical extrusion press cuts operating and maintenance costs, and increases tool life. This results in the lowest cost method of producing small diameter seamless steel tubing ever developed.

Write us for further information on pipe and seamless tube mill equipment, mechanical extrusion presses, cold straightening machines, hydraulic equipment, or other special machinery.

M.3.4

"World Specialists in High-Speed Tube-Mill Machinery"

MANNESMANN-MEER ENGINEERING & CONSTRUCTION COMPANY

900 Line Street, Easton, Penna.

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Cincinnati, St. Paul, 15 cents; Seattle and Spokane, Wash., no charge.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††§		Carbon	Floor
Baltimore	6.20	7.64	7.78	7.00	...	6.86	8.17[4]	12.04	6.98	6.85	7.98
Birmingham	6.10	7.00	8.00[2]	6.30	...	6.15	8.90	....	6.35	6.25	8.65
Boston	6.89	7.83	9.18	7.13	...	6.87	8.35	12.28	7.06	7.13	8.26
Buffalo	6.18	7.15	8.96	6.79	...	6.35	7.70	12.17	6.59	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37	....	7.10	7.10	8.27
Chicago	6.18	7.12	8.00	6.42	...	6.28	7.30	11.75	6.46	6.33	7.46
Cincinnati	6.51	7.19	8.42	6.72	...	6.58	7.66	12.17	6.93	6.80	7.68
Cleveland	6.18	7.12	7.90	6.58	...	6.34	7.40	11.89	6.79	6.50	7.79
Detroit	6.38	7.29	8.27	6.69	7.26	6.56	7.60	11.92	6.90	6.80	7.80
Erie, Pa.	6.19	7.13	9.01	6.54	...	6.28	7.65	....	6.56	6.50	7.79
Houston	7.15	7.60	9.40	7.45	9.30[3]	7.45	9.30	....	7.35	7.20	8.56
JerseyCity,N.J.	6.54	7.45	8.42	6.82	...	6.75	8.43[4]	11.84	6.50	6.67	8.01
Los Angeles	7.25	9.00	9.35	7.55	11.20	7.15	9.10	13.05	7.35	7.20	9.25
Milwaukee	6.35	7.29	8.17	6.59	...	6.45	7.57	11.92	6.63	6.50	7.63
Moline, Ill.	6.53	7.47	8.35	6.77	...	6.63	7.65	....	6.81	6.68	...
New York	6.54	7.45	8.42	6.82	...	6.75	8.43[4]	11.84	6.50	6.67	8.01
Newark, N. J.	6.78	7.75	8.42	7.16	...	7.06	8.43[4]	....	6.90	6.99	8.30
Norfolk, Va.	6.90	...	...	7.20	...	7.20	8.50	....	7.20	7.15	7.85
Philadelphia	6.17	7.13	7.91	7.02	8.80	6.87	8.19[4]	11.89	6.67	6.63	7.65
Pittsburgh	6.18	7.12	8.00	6.55	...	6.28	7.65	11.89	6.46	6.33	7.46
Portland, Oreg.	8.15	8.70	9.40	7.90	...	7.60	10.65	....	7.50	7.55	9.40
Richmond, Va.	6.50	7.45	8.00	7.10	...	7.05	7.95	....	7.10	6.85	8.10
St. Louis	6.48	7.42	8.30	6.72	...	6.58	7.70	12.05	6.86	6.73	7.86
St. Paul	6.84	7.78	8.66	7.08	...	6.94	8.06	....	7.12	6.99	8.12
San Francisco	7.35	8.70	10.15	7.60	...	7.15	9.75	13.05	7.25	7.20	9.25
Seattle	8.15	9.50	9.80	8.00	...	7.60	10.65	13.50	7.60	7.60	9.40
Spokane	8.15	9.40[1]	9.80	7.60	...	7.60	10.55[4]	14.15	7.25	7.35	9.60
Washington	6.71	8.15	8.35	7.51	...	7.37	8.43	....	7.49	7.36	8.49

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extras excluded); ‡ includes 35-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb and in Erie where base is 1000 lb and over; [1]—500 to 9999 lb; [2]—1000 to 1999 lb; [3]—1000 lb and over; [4]—1500 lb to 3999; [5]—under ½ in.

Holiday Lull Cuts Warehouse Sales

Curtailment of manufacturing operations reflected in drop in distributors' bookings. Pickup in first quarter is expected to be gradual, reaching a peak in March

Cleveland—Local distributors anticipate little in the way of new business over the next week or so with widespread curtailment of manufacturing operations in prospect during the holidays. As a result, December order volume is expected to fall noticeably under that of November.

Meanwhile, warehouse stocks are in best balance they have been for a long time past, placing the distributors in excellent position to care for customers' needs promptly when they re-enter the market after turn of the year.

Generally, 1954 prospects are considered promising. However, the warehousemen think there will be some shrinkage in volume. Greater selling effort will be necessary from here on, with competition noticeably stiffer.

The distributors are particularly concerned that over coming months they may lose to the mills the larger orders they have been entertaining in recent past years.

Philadelphia—Some distributors believe January business will top that for December. However, they anticipate only modest improvement with the trend reaching peak for the quarter in March. December business will be down from November, on the basis of present prospects, the yearend holidays having an adverse effect.

Boston — Warehouses have ample steel supply and are soliciting orders. A year ago business was plentiful, but steel was scarce. Distributors look for a mild pickup in first quarter with March probably the best month. Most sellers are now buying on a month-to-month basis.

Pittsburgh — Distributors have filled most of their tonnage requirements for steel products except light plate, wide flange beams and some bar shapes and standard structural shapes. They are now able to care for virtually all incoming orders.

Chicago — Warehouse stocks now exceed normal inventory in total tonnage but sizes and grades are little better than 75 per cent of normal. Steel users have tapered off their buying sharply. Part of this is because of the usual yearend letdown.

STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A-305	$4.65	$4.75	$4.65	$4.90
Bar Size Angles	4.30	4.40	4.30	4.58
Structural Angles	4.30	4.40	4.30	4.58
I-Beams	4.30	4.40	4.30	4.58
Wide Flange Beams	4.94	5.02	4.94	5.22
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.87	5.95	5.87	6.25
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.00	25.70	25.50	26.34
Barbed Wire	6.20	6.30	6.20	6.48
Merchant Bars	4.55	4.65	4.55	4.83
Hot Rolled Bands	4.95	4.75	4.65	4.93
Wire Rods, Thomas Commercial No. 5	4.68	4.75	4.73	5.00
Wire Rods, O-H, Cold Heading Quality No. 5	5.14	5.21	5.19	5.46
Channels	4.40	4.50	4.40	4.66
Bright Common Wire Nails, 8d	6.55	6.65	6.60	6.85

Size O.D.	Wgt/Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

but mostly because mills are giving almost unheard of prompt delivery and the fact that inventory reduction is being practiced widely.

Cincinnati — Warehouse business continues on the dull side. Many distributors think steel consumption will pick up considerably after turn of the year.

Los Angeles—Warehouse stocks, at 80 to 95 per cent of normal, are more than adequate to meet most fabricators' needs reduced by holiday influences. Plates are an exception.

Tin Plate . . .

Tin Plate Prices, Page 100

Chicago—Although there has been some curtailment in output of tin plate because of the extended strike at canmaking plants, manufacture still is at a relatively high level. It is figured that only loss in use of cans is that involving citrus fruits.

Alloy Steel Shipments Slip

New York—Net shipments of alloy steel products, other than stainless and excluding shipments within the industry for further conversion, totaled 418,470 net tons in October, according to the American Iron & Steel Institute. This was a slight decline compared with 444,671 tons in September, and was also down compared with shipments of 561,593 tons in October, 1952.

Shipments in the first 10 months this year amounted to 5,158,757 net tons, comparing with 4,064,253 tons in the like period of last year. Shipments in 1952 were adversely affected by the June-July steel strike.

Shipments of Alloy Steel Products
(Other than stainless)
(Net Tons)

Products (full alloy)	October	10 months 1953	10 months 1952
Ingots	16,653	210,445	214,647
Blooms, slabs, etc.	34,307	489,571	427,382
Wire rods	1,450	17,808	12,991
Structurals	834	18,265	11,792
Plates	18,181	175,627	149,971
Rails, standard	116	180	164
Rails, all other	.....	65	60
Wheels	16	697	770
Axles	22	532	174
Bars, hot-rolled	140,409	2,002,970	1,567,104
Bars, cold-finished	27,827	307,654	264,752
Tool steel	8,096	85,153	85,097
Oil country goods	23,264	203,692	120,048
Mechanical tubing	20,893	247,095	216,199
Pressure tubing	3,828	41,644	31,775
Wire, drawn	3,539	44,883	45,362
Sheets, hot-rolled	1,682	13,794	11,558
Sheets, cold-rolled	226	2,346	2,271
Elec. sheets & strip	57,775	584,998	410,002
Strip, hot-rolled	1,724	18,092	14,691
Strip, cold-rolled	1,213	13,988	14,498
All other	.....	319	2
Total	362,055	4,479,818	3,601,310
High-Strength Low Alloy Products			
Ingots	.....	2	.....
Blooms, etc.	.....	142	2
Structurals	2,383	34,171	47,161
Plates	19,020	184,540	136,329
Bars, hot-rolled	1,040	22,043	16,063
Sheets, hot-rolled	26,281	296,880	180,957
Sheets, cold-rolled	6,004	111,895	64,961
Sheets, galvanized	.....	11	.....
Strip, hot-rolled	1,376	23,829	14,502
Strip, cold-rolled	129	4,117	2,228
All others	182	1,309	740
Sub Total	56,415	678,939	462,943
Total Alloy Steel	418,470	5,158,757	4,064,253

Sheet Buying Lags Over Holidays

January bookings reported substantial although some mills' schedules are unfilled. Ordering spurt for February-March needs expected soon. Excess inventories being worked off

Sheet and Strip Prices, Page 98 & 99

Boston—Sheet producers expecting heavy orders for cold-rolled from automobile builders, are not generally absorbing freight to equalize the lowest delivered price in New England. Suppliers of automobile components and parts are holding off forward orders for sheets and strip until they know more definitely what volume of their production will be required for first and second quarter assembly.

For other uses, some February orders, notably specialties, including electrical strip, are trickling in, but on the whole bookings beyond January are light.

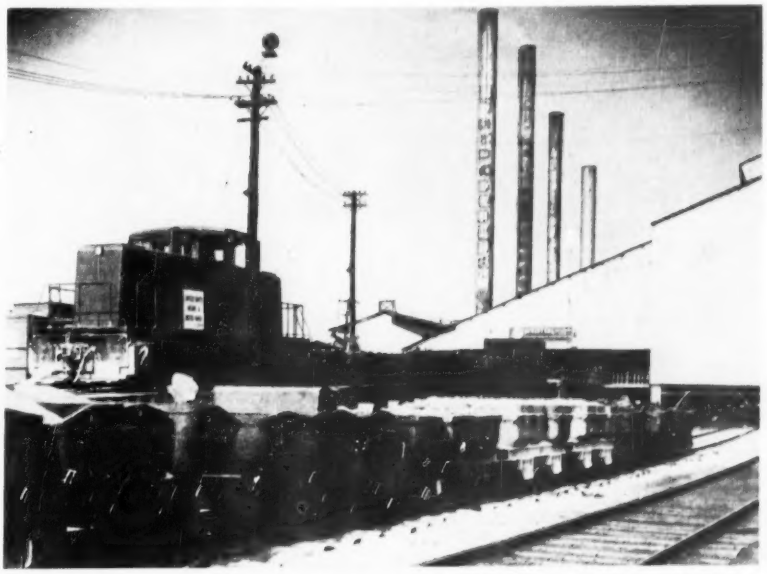
While freight absorption policies vary, enough additional tonnage is being ordered at competitive prices to assure ample supply during the months immediately ahead. Sellers are not booking up to earlier estimates.

New York—Most producers of hot and cold-rolled sheets now have fairly substantial tonnage on their books for January, but in no case are schedules fully booked. Nor are sheet mills fully scheduled on specialties, and in only one important case, it seems, will schedules be fully absorbed that month in production of galvanized sheets. In this instance, the producer got behind on promises and is counting on a fair carryover at end of the year.

Cleveland—Sheetmakers are confident there will be a sharp pickup in first quarter buying by end of the coming month. January bookings are described as substantial, but the carryover from fourth quarter will be relatively small.

The mills are pressing aggressively for February-March delivery tonnage. Expectations are first quarter volume will be relatively heavy, with buying picking up noticeably toward the end of January as consumer inventories vanish and automotive and related needs begin to exert pressure in the market.

Philadelphia—Sheet mills are fairly well out of the market on cold-rolled sheets for January, for the reason rolling cycles on that product are such most producers can no longer add tonnage although their



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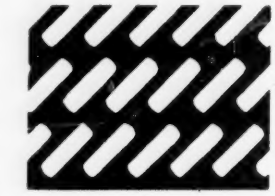

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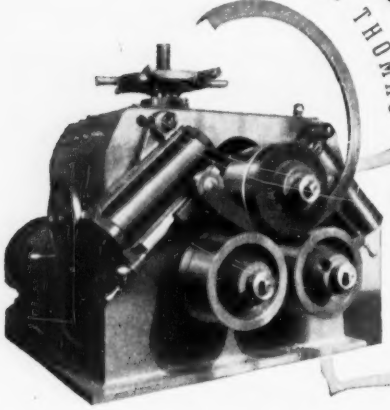

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PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES

schedules will not be fully taken up. In hot-rolled sheets and most specialties they can still accept business for January.

There has been some pickup in demand for February and producers generally are much more optimistic for that month than they are for January.

Pittsburgh—a major automaker is reported ready to return to the sheet market for about the same quantities required in last year's first quarter. Whether other producers will follow depends partially on public acceptance of new auto models.

Chicago—Overall demand for sheets has shrunk to the lowest point in 1953, but the take of the automobile industry is pretty substantial. It is expected consumers' first quarter requirements will hold at something less than full rolling potential, but second quarter is regarded as sure to bring sharp improvement.

Los Angeles—Kaiser Steel Corp.'s Fontana Work's first quarter sheet books are filling slowly due to offerings in this district of flat-rolled from eastern mills.

Steel Bars . . .

Bar Prices, Page 98

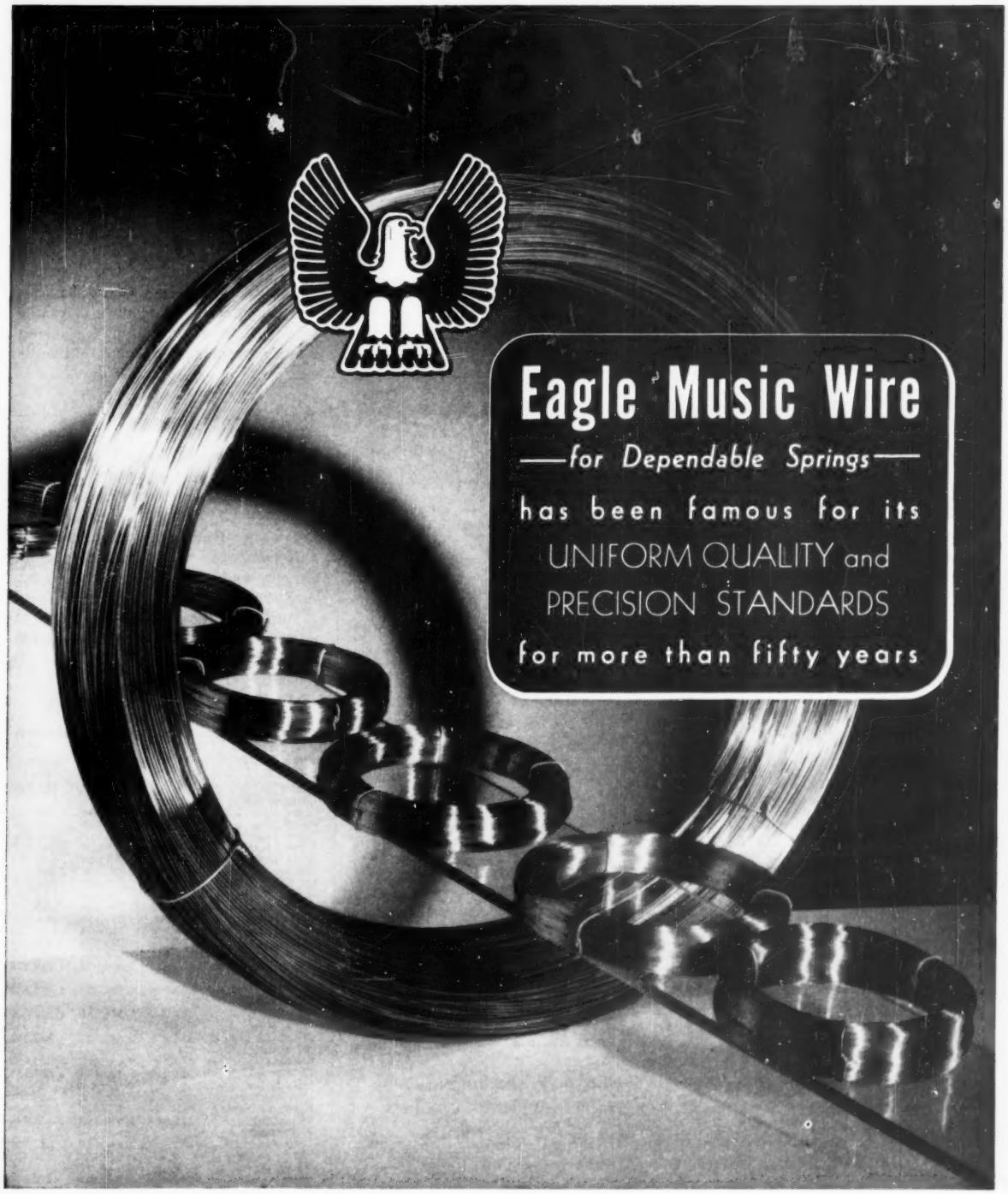
Cleveland—With shortages a thing of the past, bar buyers are ordering sparingly, buying little in the way of inventory with supplies readily available from mills and warehouses.

January mill bookings are reported as fair but sellers generally say first quarter bookings to date are disappointing. They expect noticeable pickup in ordering before end of next month, considerable dependence being placed on an anticipated spurt in automotive requirements.

Boston—There are spot openings in carbon bar schedules for January, but bookings for next month will surpass those in December with most producers. Yet buying beyond January is confined largely to special processed stock, including turned and ground. Volume in alloys is slow.

New York—Hot carbon bar producers still have capacity open for January and will accept still further tonnage for a short while at least. The general expectation is that schedules will not be fully booked for the month, as inquiry is lagging on virtually all sizes.

Pittsburgh—Barmakers report softness in small bars and weakness in sales to producers of fasteners. Reluctance of auto and appliance makers to buy very far ahead is slowing sales of cold drawn bars. Steel warehouses with well-rounded supplies of



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bars, have cut purchases of such items as drill rod.

Philadelphia — Hot-rolled carbon bar producers are experiencing quiet demand, but they anticipate a slow but steady increase after turn of the year. Most mills are far from being booked up for January. Moreover, they do not expect their schedules will be filled for that month.

Los Angeles—Cold-drawers, faced by drastic weakening in demand for cold finished bars, look to the Christmas shutdown to help adjust production schedules.

Plates . . .

Plate Prices, Page 98

Boston—Where plate mill production is down or curtailed in eastern Pennsylvania, lack of backlog or meager January bookings is the answer. Those charging the higher premium prices until recently are hit hardest. Only spot tonnage sold at higher premiums since third quarter and when supply caught up with demand there was no building of backlogs at higher prices.

Other mills at, or near regular mill prices, still have openings for January with a trickle of February tonnage in.

Philadelphia—Plate business is dull with the mills still in position to take more tonnage for January. Little business is being carried over at end of this year, so that producers can devote practically a full month's schedule to new orders should such business develop in time.

Pittsburgh—Light plate weighing under 25 pounds per foot remains among the few items which fabricators find difficult to obtain. A seasonal lull in construction is causing consumers to reduce orders, but mills continue to operate near capacity.

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Carbon Steel Shipments Rise

New York—Shipments of carbon steel products (excluding tonnage for further conversion) in October totaled 6,260,177 net tons, reports the American Iron & Steel Institute. This compares with 5,908,839 in September, and with 6,536,786 in October, 1952.

Tonnage moved in the first 10 months this year totaled 62,911,108 comparing with 49,784,035 tons in the like period of 1952.

Shipments of Carbon Steel Products
(Net Tons)
(Excluding shipments for further conversion)

Products	October	10 months 1953	10 months 1952
Ingots	23,446	619,722	618,536
Blooms, slabs, etc.	154,670	1,804,634	1,368,106
Skelp	10,211	91,045	85,153
Wire rods	50,698	689,315	564,250
Structurals	438,865	4,045,226	3,241,175
Steel piling	35,033	273,327	180,297
Plates	604,749	6,037,850	5,299,997
Rails, standard	155,213	1,511,662	1,064,229
Rails, all other	8,293	74,432	91,498
Joint bars	11,243	104,133	90,772
Tie plates	38,905	361,425	304,562
Track spikes	10,200	105,886	81,126
Wheels	28,154	283,292	273,596
Axles	10,620	136,397	131,153
Bars, hot-rolled	612,811	6,039,978	4,796,479
Bars, reinforcing	160,744	1,584,359	1,448,830
Bars, cold-finished	147,265	1,577,465	1,236,302
Tool steel	1,400	14,667	17,049
Standard pipe	243,019	2,414,821	1,932,778
Oil country goods	153,533	1,450,090	1,162,002
Line pipe	321,119	3,013,664	2,328,144
Mechanical tubing	63,231	698,968	539,696
Pressure tubing	33,324	327,335	293,851
Wire, drawn	195,604	2,410,603	2,028,496
Wire, nails & staples	52,113	464,913	546,227
Wire, barbed	7,669	147,588	197,657
Wire, woven fence	13,096	225,215	286,322
Wire, bale ties	2,144	34,646	54,825
Black plate	62,300	649,275	724,791
Tin plate, hot dipped	98,889	1,145,048	1,111,805
Tin plate, electrolytic	262,548	2,947,689	2,310,373
Sheets, hot-rolled	637,098	6,323,357	4,632,012
Sheets, cold-rolled	1,006,721	9,278,978	6,153,795
Sheets, galvanized	208,705	1,938,091	1,558,255
Sheets, other coated	19,408	223,638	168,427
Sheets, enameling	18,108	194,529	117,779
Elec. sheets & strip	10,092	118,364	68,915
Strip, hot-rolled	176,743	1,909,203	1,415,530
Strip, cold-rolled	172,193	1,640,278	1,241,245
Total	6,260,177	62,911,108	49,784,035

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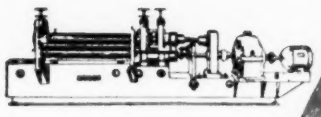

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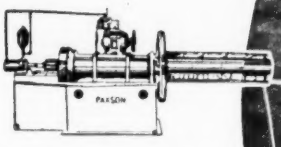

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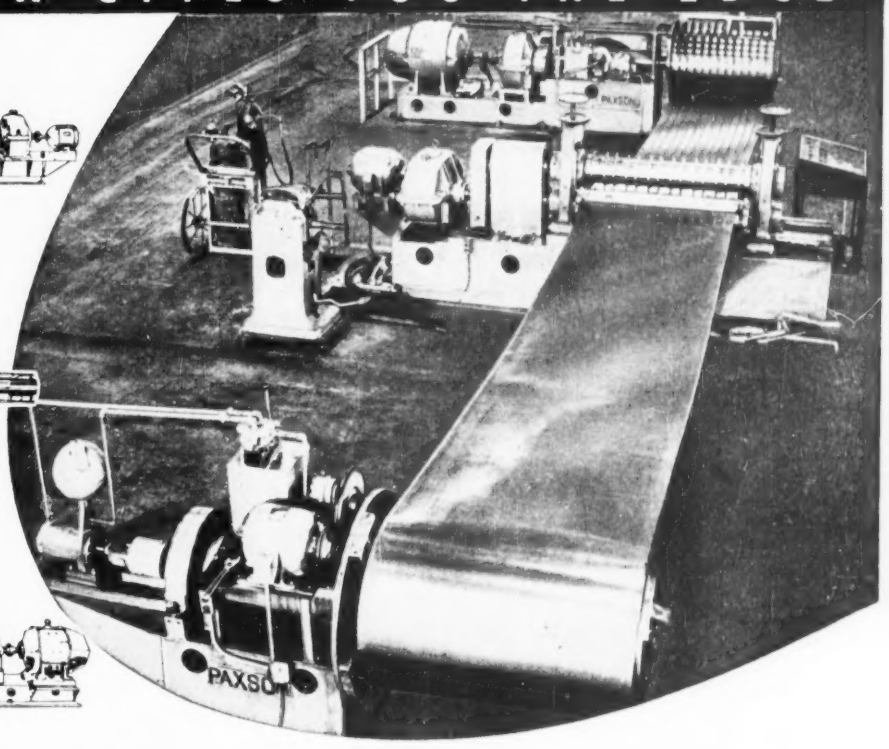

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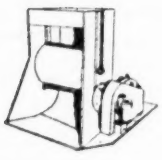

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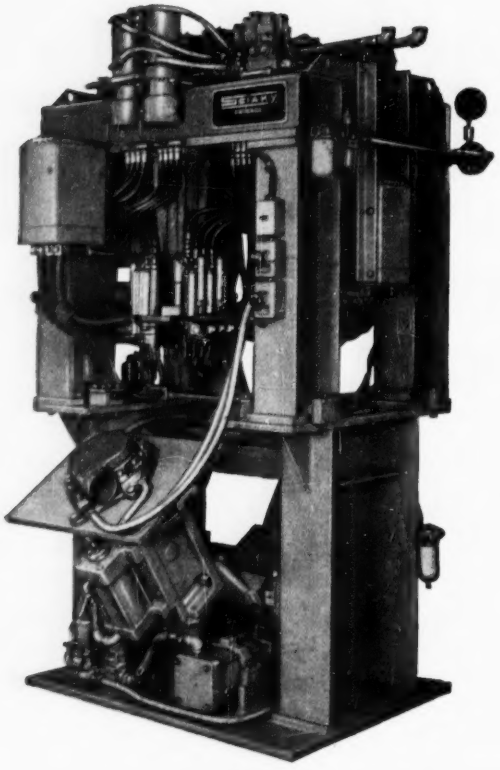

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Stainless Shipments Gain

New York—Shipments of stainless steel products (exclusive of tonnage for further conversion within the industry) amounted to 48,203 net tons in October, reports the American Iron & Steel Institute. This was a slight increase compared with 47,247 tons moved in September, but was down noticeably from the 57,232 tons shipped in October, 1952.

Total movement of stainless in the first 10 months this year was 528,835 net tons, a sharp increase compared with 396,327 shipped in the corresponding period of 1952.

Stainless Steel Products Shipments
(Net shipments in net tons)

Products	October	10 months 1953	10 months 1952
Ingots	1,681	21,261	15,879
Blooms, slabs, billets, tube rounds, sheet bars	1,311	17,686	14,995
Wire rods	362	5,672	4,936
Structurals (heavy)	25	295	73
Plates	2,367	26,277	21,735
Bars, hot-rolled	3,459	39,062	38,521
Bars, cold-finished	4,363	50,421	40,149
Mechanical tubing	356	4,773	5,589
Pressure tubing	1,154	13,555	10,150
Wire, drawn	1,998	28,035	23,944
Sheets, hot-rolled	1,301	14,012	21,182
Sheets, cold-rolled	9,263	105,728	84,966
Strip, hot-rolled	361	3,590	2,791
Strip, cold-rolled	20,201	198,449	111,385
All other	1	19	32
Total	48,203	528,835	396,327

Semifinished Steel . . .

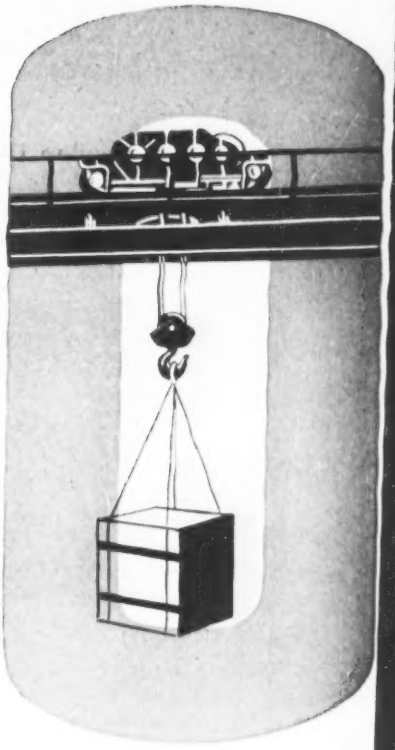
Semifinished Prices, Page 98

Chicago—For the first time since 1947 United States Steel Corp. curtailed steelmaking operations for the Christmas holiday. At both the Gary and South Chicago plants no steel was made in open hearth or electric furnaces on Christmas day.

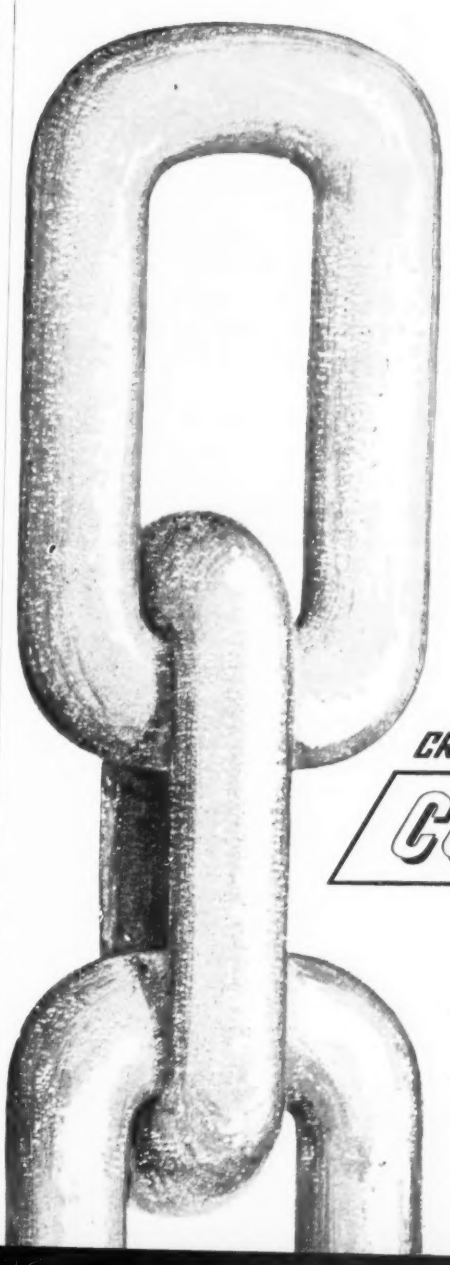
Early in the week 6 of 11 active blast furnaces were banked to leave only 5 operating by Thursday night. None of the 10 active blast furnaces at South Works tapped iron on Christmas day—this being the first time since 1939 that all stacks at this plant were out of production.

Cleveland—Steelmaking operations in this district dropped to 55 per cent of capacity last week, down 25½ points from the revised operating rate for the preceding week. Except for strike interruptions, this is the lowest level of operations reported in this district in any week since before the war.

The sharp drop largely is attributable to the closing down of all Republic Steel Corp.'s openhearths here Dec. 21, the suspension to continue until some time this week. Shutting down of the furnaces, while partly due to the holidays, mainly was occasioned by the necessity for closing down operations at the company's blooming mill to permit repairs and alterations. Only two out



is this ⇨ the MISSING LINK?



Strong link in your production chain can be a Conco Crane — custom-designed for a specific need. Conco Cranes are available in the capacity you need, the right lift, the right speed, the right clearances to serve a given station faster, at less cost, with less man power. Conco Cranes are backed by 36 years experience in the design of cranes, hoists, trolleys. Write for Bulletin 3000A illustrating and describing the Conco line.

CRANES HOISTS
CONCO

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Division of H. D. Conkey & Company
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AFFILIATES:
Conco Engineering Works-Domestic Heating Equipment
Conco Building Products, Inc., Brick, Tile, Stone

AMERICAN CHEMICAL PAINT COMPANY
AMBLER ACP PENNA.

Technical Service Data Sheet
Subject: RUST PROOFING WITH PERMADINE®

Steel parts that have been Permadized and then "sealed" with a rust-preventive oil such as "Granoleum" are effectively protected from rust. And, if the oiled "Permadine" coating should be damaged, rusting will not spread beyond the area of exposure.

Note: Automotive and other rubbing parts subject to friction are usually given "Thermoil-Granodine" manganese-iron phosphate coatings for both wear-resistance and protection from corrosion.

DATA ON THE "PERMADINE" COATING

Type of coating	Zinc phosphate
Object of coating	Rust and corrosion prevention
Typical products treated	Nuts, bolts, screws, hardware items, tools, guns, cartridge clips, fire control instruments, metallic belt links, steel aircraft parts, certain steel projectiles and many other components
Government Specifications	U.S.A. 57-0-2C, Type II, Class B MIL-C-16232, Type II U.S.A. 51-70-1, Finish 22.02, Class B AN-F-20 Navy Aeronautical M-364 JAN-L-548
Scale of production	Large or small volume; large or small work
Method of application	Dip Barrel tumbling, racked or basketed work
Equipment notes	Immersion tanks of suitable capacity. Cleaning and rinsing stages can be of mild steel. Coating stage can be of heavy mild steel or stainless steel
Chemicals required	"Permadine" No. 1
Pre-cleaning methods	Any common degreasing method can be used. Alkali cleaning ("Ridosol"), Acid cleaning ("Deoxidine"), Emulsion-alkali cleaning ("Ridosol" - "Ridoline"); vapor degreasing, solvent wiping, etc., are examples. Acid cleaning may need to follow other cleaning methods if rust or scale is present.
Bath Temperature	190° - 205°F.
Coating time	20 - 40 minutes
Coating weight range	1000 - 4000 mgs. per sq. ft.
Technical Service Data Sheets	No. 7-20-1-2 T.M. No. 5

CHEMICALS ACP PROCESSES
WRITE FOR FURTHER INFORMATION ON "PERMADINE"
AND YOUR OWN METAL PROTECTION PROBLEMS
CHEMICALS ACP PROCESSES

of 6 blast furnaces at Republic's plant are on.

At the same time steelmaking operations at the Otis Works of Jones & Laughlin Steel Corp. were suspended 48 hours over the Christmas holiday.

Los Angeles — Addition of new charging equipment will close down four open-hearth furnaces at the Torrance plant of Columbia-Geneva Division, U.S. Steel Corp. from Jan. 1 to 10.

Wire . . .

Wire Prices, Page 100

New York—Many wire consumers have not covered requirements for first quarter. January schedules are only partially filled on some products, but small orders for prompt delivery are slightly more numerous.

If first quarter programs of most consumers are to be met, orders must soon appear. This is notably true of the automobile industry.

Structural Shapes . . .

Structural Shape Prices, Page 98

Philadelphia — Structural market activity is spotty, reflecting in part yearend influences. Little outstanding tonnage has been placed recently and new inquiry is lagging.

Fabricating shops were down for the long Christmas weekend and are planning to be down this week for the New Year's weekend, but for that period only.

Boston — Low bid for fabricated steel in place, Lincoln Square, Worcester, grade crossing, 3040 tons, is 11.25c per pound. Including handling, storage and erecting costs, this represents a substantial decline in fabricating charges from the average six months back.

Similar work brought out quotations of 17.00c to 18.00c at earlier peak.

Tonnage being estimated at yearend is heavier, also contracts which include 3450 tons for power plant additions.

Fabricating shops are well balanced on standard structural material, lacking only wide flange beams. Considerable outstanding bridge work is of rolled beam span design.

Pittsburgh—Seasonal dip in new construction projects is not yet felt in production, which continues at capacity. While shipments remain at their customarily high level incoming orders dip slightly.

New York—The structural market is winding up the old year with approximately 25,000 tons for the Newark Bay bridge and several other

Operations in the foundry at Greenlee Brothers & Company had been hampered by excessive smoke and fumes. Smoke, which resulted from burning of residual oil and flour, and fumes from core ovens made it impossible for crane operators to work at maximum efficiency. Installation of Dravo Crane Cab Conditioners eliminated these intolerable conditions, greatly improving the efficiency and alertness of crane operators while safe-guarding their health.

Dravo Crane Cab Conditioners are ruggedly-constructed ventilating units, fabricated specifically for rough industrial usage and are especially designed for conditions which require fume removal. These units provide a continuous supply of air from which dust and dirt has been removed. Electric strip heaters maintain temperatures of 68° to 72° F. in crane cabs during winter months.

These units can be easily installed vertically, horizontally, or at any angle which space permits. A separate control cabinet allows on-off operations and regulates heat. Dravo Crane Cab Conditioners are also ideal for installation on mobile cranes, pulpits and other equipment operating where similar conditions exist.

Only Dravo has a complete line of crane cab coolers and conditioners. All units are available now! Write or phone your nearest Dravo office today for more information and have our representative call on you. Ask for Bulletin No. PS-1301-1

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ST. LOUIS . WASHINGTON

NON-FLUID OIL

TRADE MARK REGISTERED

"NR" Grades Lubricate and Rust-Proof Pneumatic Tools

"NR" grades of NON-FLUID OIL absorb the moisture in compressed air to form a stable and permanent emulsion which both *lubricates* and *rust-proofs* pneumatic tools. During idle time, there is no separation of the moisture from the oil . . . all surfaces have a constantly maintained protective film, without any dry areas or streaks where rusting or corrosion can take place.

NON-FLUID OIL . . . the modern lubricant is available in many "NR" grades to meet specific air tool lubrication problems. It is especially made to stay on bearing surfaces, does not blow through tools as quickly as ordinary lubricants, and so lasts 3 to 5 times longer.

Write for Bulletin #550 and free testing sample of "NR" grade. Try it on your pneumatic tools and prove to yourself the superiority of NON-FLUID OIL.

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NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture.

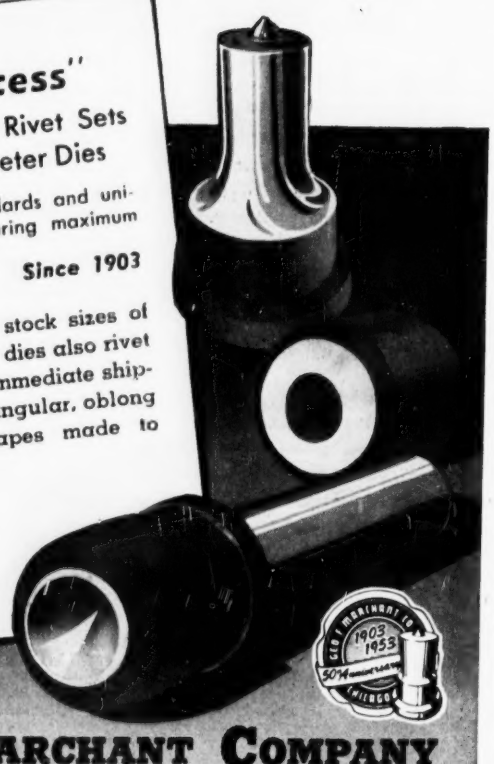
"New Process"

Punches • Dies • Rivet Sets
Compression Riveter Dies

Made of highest standards and uniform quality thus insuring maximum service. Since 1903

Large inventory of stock sizes of round punches and dies also rivet sets available for immediate shipment. Square, rectangular, oblong and elliptical shapes made to order.

Write Dept. A for Catalog 46



GEO. F. MARCHANT COMPANY

1420-34 So. ROCKWELL STREET • CHICAGO 8, ILLINOIS

jobs, of fair size, having just been placed. Inquiry is featured by the 24,000-ton office building at 42nd St. and Lexington Ave., noted recently, but there is still quite a little miscellaneous work up for figures.

Fabricators report an easier flow of standard shapes from the mills and also some improvement in supply of heavier wide flange sections. The lighter are in tight supply.

Chicago — Structural shapes continue a relatively tight item in this area. Needed most are wide flange in both large and small sizes. Construction is not suffering to the extent consumer goods are and to meet current requirements consumers are still taking foreign shapes at premium prices and tonnage produced in mills out of the district involving higher delivery costs.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 98

Boston—Bridge requirements predominating, concrete reinforcing bar volume is more competitive and is often placed on a price, rather than delivery basis. Reinforcing bar distributors have more tonnage available and are soliciting orders beyond regular customers.

Grade crossing elimination contracts at Worcester account for 1500 tons with 300 tons placed.

Tubular Goods . . .

Tubular Goods Prices, Page 101

Boston—Merchant steel pipe shipments are down to three-four weeks with mills shipping from stock in some cases. Buying is spotty and but a small part of buttweld and tubing specialties offered is being taken by distributors.

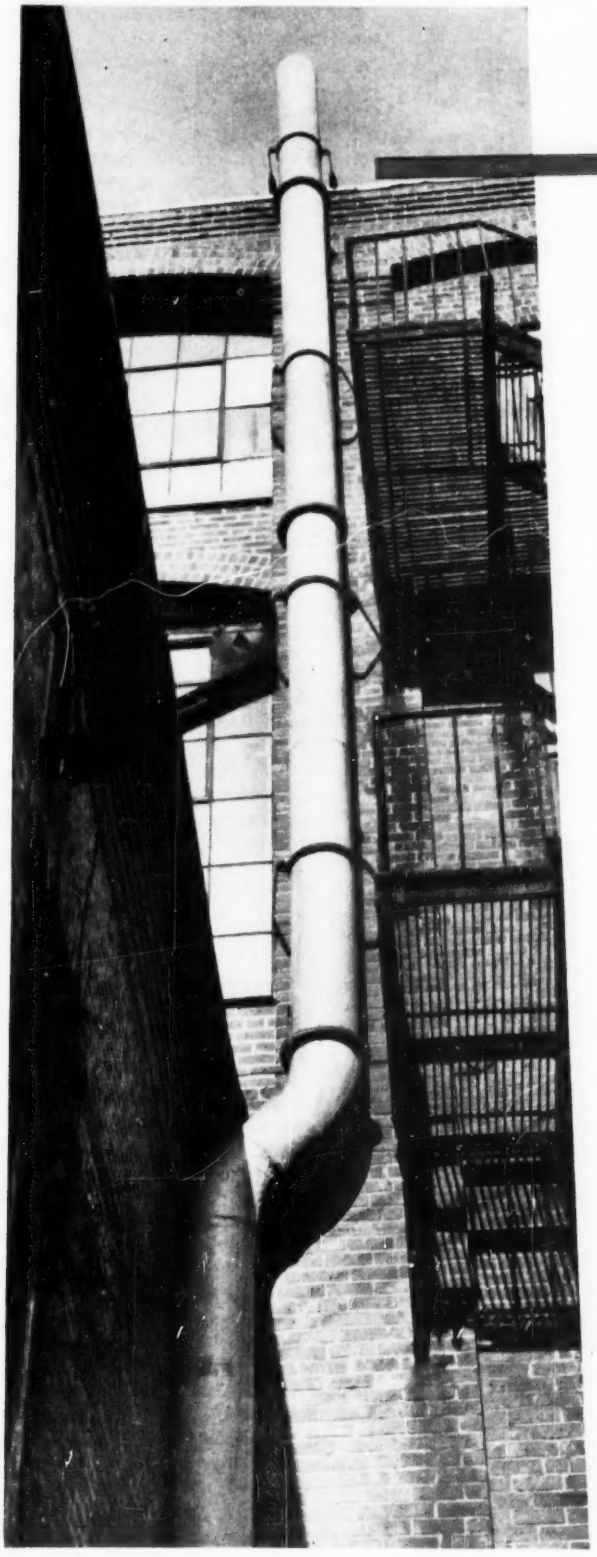
The latter are shading prices at secondary levels with 10 points off frequent.

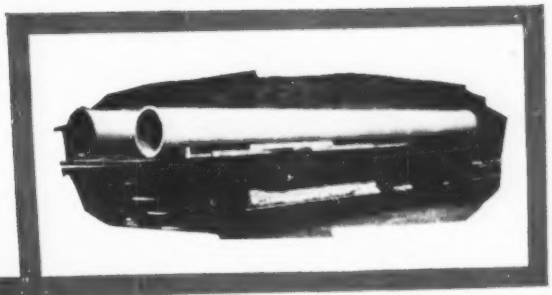
Welded pipe prices are due for an adjustment. Fairless, Pa. will become the nearest basing point once prices for that mill are announced even should quotations equal the $4 higher Sparrows Point price over Pittsburgh and other producing districts.

New York—Merchant pipe is moving slowly, due largely to adverse seasonal influences. Resellers are cutting prices in an effort to reduce inventories, and where inventories are already well down there is a disposition on the part of distributors to move slowly on replacements.

Pittsburgh—Welded pipe production continues at about 80 per cent of capacity here, with seamless operations slightly higher. Mechanical

"Pla-Tank" Products are manufactured by
The Chemical Corporation, Springfield 9, Mass.





STACKS, DUCTS, HOODS AND PIPES

of reinforced plastic combine strength, light weight, and chemical resistance

Reinforced plastics produced from glass fibers bonded with BAKELITE Polyester Resins form the 40-foot long fume duct shown on the flatcar above and the 77-foot fume vent stack illustrated at the left.

Reinforced plastic structures combine high mechanical strength with light weight. They are easily handled and quickly assembled, usually without special rigging. They often eliminate heavy reinforcing of the base when mounted on roof framing. They won't rust, and their resistance to weathering and chemical attack reduces maintenance costs.

Other structures, such as pipes, ducts, hoods, and tanks are also produced from reinforced plastics made with BAKELITE Polyester Resins. According to the manufacturer, the pipe can carry corrosive liquids under moderate pressures. Pipe sections can be joined right in the field by "paint brush" welding—wrapping resin-soaked glass fiber mats around joints and curing them. Ducts and hoods have a one-piece molded construction that prevents leaks. Tanks are made in a great variety of standard and custom sizes for electroplating purposes.

To learn more about these large-scale reinforced plastic structures, and about the BAKELITE Polyester Resins that make them possible, write Dept. SY-49.

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TRADE-MARK
POLYESTER RESINS

TRADE MARK

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Detailed bulletin regarding YOUR specific problems on request. Send for it.
THE CHAMPION RIVET CO.
CLEVELAND, OHIO • East Chicago, Ind.

tubing sales are still slowed by inventory reductions.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 121

Washington — Coke production in October totaled 6,560,639 net tons, reports the Bureau of Mines. This was an increase of about 2 per cent over September output.

Stocks of coke and coking coal at oven plants increased during the month. At the end of the period coking coal stocks amounted to 16,609,099 tons, sufficient for 58.7 days' supply at the prevailing rate of consumption. Coke stocks were equal to 12.6 days' production.

In the first 10 months this year total output of coke was 66,160,938 tons, of which 61,571,789 tons were oven coke and 4,589,149 beehive. In the like period of 1952 production totaled 55,199,200 tons, of which 51,572,700 were oven coke and 3,626,500 beehive.

Pig Iron . . .

Pig Iron Prices, Page 102

Cleveland—Merchant pig iron sellers anticipate little activity in the market until next month. Current movement of iron on contracts will slow down noticeably over the holidays with foundry operations curtailed generally.

With iron supplies plentiful consumers are disinclined to order much for inventory. Conseqently, competition for orders is increasingly in evidence and is expected to increase after turn of the year as producers aggressively push for new business Pickup in demand is expected in January.

Blast furnaces will be banked on a broader scale over the holidays than has been the experience for a number of years past.

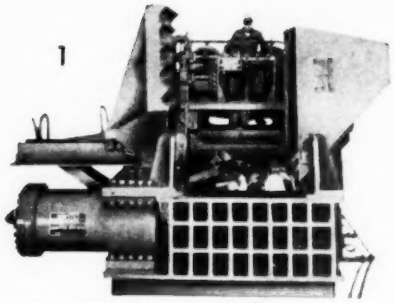
Boston—Pig iron consumers under contract with Mystic furnace are not taking all the tonnage to which they are entitled. Foundry melt is low with some yearend suspensions. Furnaces outside this district, including Buffalo, are absorbing freight to equalize delivered prices from Republic's Troy, N. Y. furnace.

Not only have blast furnace operations been slowed down at Everett, but coke ovens are also easing off.

Prices for first quarter will be announced by Mystic Iron Co. shortly.

New York—Pig iron consumption here is at low ebb for the year, with some foundries closing down last week for the holidays. With inventories in fairly good shape, improve.

(*Please turn to page* 123)



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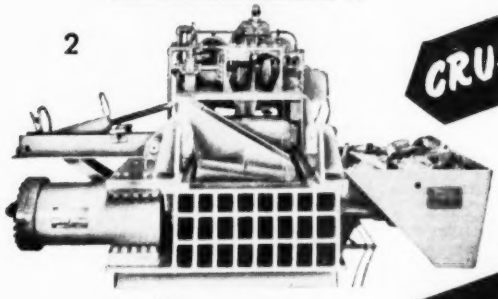
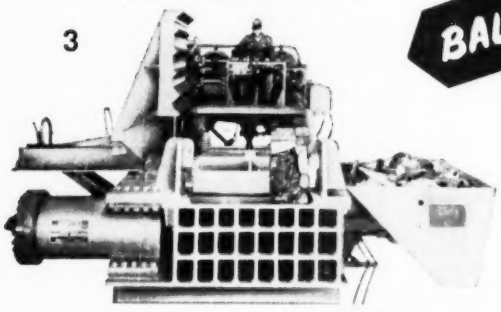


CRUSH IT



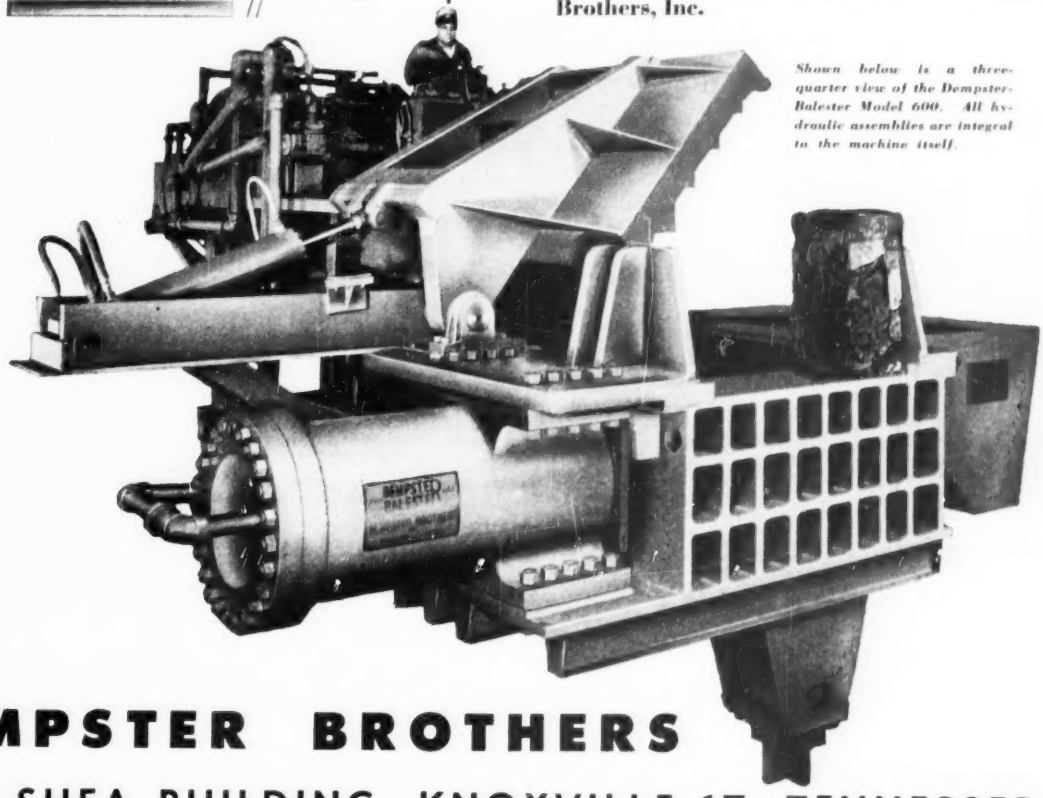
BALE IT

DEMPSTER-BALESTER GIVES YOU ALL 3 HYDRAULIC ACTIONS FOR FAST, CONSISTENT, MORE PROFITABLE SCRAP METAL BALING!

The Dempster-Balester's "*Load It—Crush It—Bale It*" hydraulic action assures you of the fastest scrap metal baling operation . . . the closest approach yet to automatic baling!

It's a simple 1-2-3 continuous operation . . . Skip Pan Loader loads charging box. As Skip Pan returns to re-loading position, Auxiliary Compression Door compresses scrap with a 45-ton force. As Compression Door returns to up-right position, charging box closes . . . scrap is baled and ejected. Skip Pan has been re-filled and is ready to re-load charging box as soon as bale is ejected. As each cycle ends, another begins . . . *Load It—Crush It—Bale It—Load It—Crush It—Bale It* . . . one bale after another.

Without question, Dempster-Balesters are the fastest, most efficient presses baling scrap metal today! And you have six to choose from . . . three standard and three high speed models that turn out high density bales in capacities to meet any requirement from 1 to 9 tons per hour. Write to us today for complete information. A product of Dempster Brothers, Inc.



Shown below is a three-quarter view of the Dempster-Balester Model 600. All hydraulic assemblies are integral to the machine itself.

DEMPSTER BROTHERS

8123 SHEA BUILDING, KNOXVILLE 17, TENNESSEE

CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.; add or subtract $2.60 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Carload, 31.5c; ton lots 33.5c; 250 to 1999 lb, 35.5c. Preminum for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High - Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%) Contract, c.l. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr. 36-39%, Si 26-39%, Al 7-9%, C 0.05% max). 25.75c per lb of contained chrome plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload $1.12, ton lots $1.14, less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium:. Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max). $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c,

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet. Packed c.l. 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.
(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c. Packed c.l. 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 10,000 lb W or more, $4.10 per lb of contained W; 2000 lb W to 10,000 lb W, $4.20; less than 2000 lb W, $4.32, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max. C 0.4% max). Contract, ton lot, 2" x D, $6.40 per lb of contained Cb, less ton $6.45. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ⅛" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe) Lump, carload, bulk 14.50c. Packed c.l. 15.50c, ton lots, 15.75c, less ton lots, 16.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb. contained Mo, f.o.b Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

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SIX REASONS why you should always call Standard Steel for rings and flanges:

1 **TESTING**—radiographic tests, tensile tests, hardness tests, ultrasonic probing of internal structure, etc.

2 **QUALITY STEEL**—maintained constantly through production of own steel by acid process.

3 **UNIFORMITY**—assured by precise control of forging and rolling operations.

4 **CAPACITY**—unsurpassed ability to produce weldless rings all the way up to 144″ O.D.

5 **EXPERIENCE**—produced by skilled workmen with 20 to 40 years experience.

6 **FAST SERVICE**—a vital factor in the continuing growth of Standard Steel for over 150 years.

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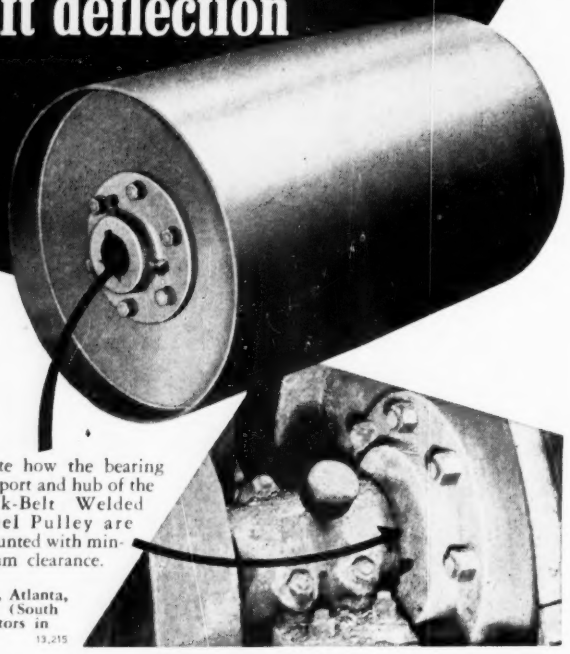
LINK-BELT Welded Steel Pulleys end one common cause of head and tail shaft failure by minimizing deflection. By making the hub flush with the pulley face, bending moment is directly decreased. In addition, Link-Belt design assures minimum disc deflection . . . reduces hub bolt stress. With water- and dust-tight construction — plus provision for interchangeable hubs—you get lower maintenance, top performance and longer pulley life. Ask your Link-Belt representative for full details.



Note how the bearing support and hub of the Link-Belt Welded Steel Pulley are mounted with minimum clearance.

LINK-BELT

WELDED STEEL PULLEYS

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities. 13,215

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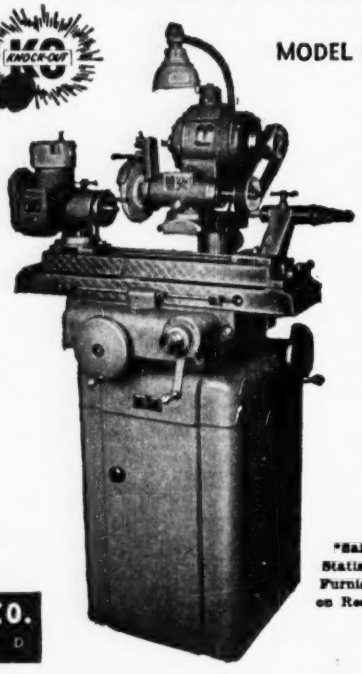

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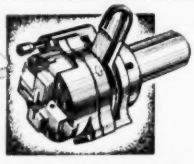

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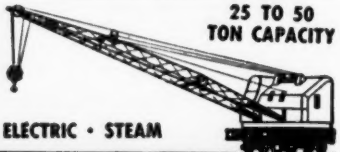

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ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	22.00
North African hematite (spot)	24.00-26.00
Brazilian iron ore, 68-69% (spot)	25.00-26.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, min. 65%, WO_3, good commercial quality	$39-$40
Domestic scheelite, mine	63.00

Manganese Ore

Mn, 48% nearby, $1.18-$1.21 per long ton unit, c.i.f. U. S. ports, duty for buyers' account; shipments against old contracts for 48% ore are being received from some sources at 90-93c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.:

Indian and African	
48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00
South African Transvaal	
44% no ratio	$27.00-$28.00
48% no ratio	34.00-35.00
Brazilian	
44% 2.5:1 lump	nom. $32
Domestic (Rail nearest seller)	
48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb Mb content, mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$2.40-$2.80
65% min.	$3.40-$3.50

Vanadium Ore

Cents per lb, V_2O_5 content, deld. mills

Domestic	31.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, O., Hays, Pa., $120; Niles, O., $123; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° *F*: Massillon, O. $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent*: Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.

60 *Per Cent*: St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 *Per Cent*: St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk; Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J. ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.00
Chicago ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, deld.	28.12
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Buffalo, deld.	28.08
Flint, deld.	28.23
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg.	30.00-33.00
Industrial xylol	30.00-33.50
Per ton, bulk, ovens	
Sulphate of ammonia	$44-45
Birmingham area	$49.50
Cents per pound, producing point	
Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

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GRAPHITE

Diam.	Length	Per 100 lb
Inches		
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5½	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

...if only for THEIR sakes

...learn how to protect yourself from death from cancer. They need *you!*

And for your sake and theirs you must keep on remembering that the best cancer "insurance" is:

FIRST...*to make a habit of periodic health check-ups no matter how well you may feel, always including a thorough examination of the skin, mouth, lungs and rectum and (for women) the breasts and generative tract.*

SECOND...*to learn the seven danger signals that may mean cancer, and go straight to the doctor at the first sign of any one of them—(1) Any sore that does not heal (2) A lump or thickening, in the breast or elsewhere (3) Unusual bleeding or discharge (4) Any change in a wart or mole (5) Persistent indigestion or difficulty in swallowing (6) Persistent hoarseness or cough (7) Any change in normal bowel habits.*

For other life saving facts about cancer, phone the American Cancer Society office nearest you, or address your letter to "Cancer"—in care of your local Post Office.

American Cancer Society

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Pig Iron . . .

(*Concluded from page* 116)

ment after the turn of the year is expected to be only moderate for a while.

Philadelphia—A number of foundries are down from Christmas through New Year's day and the movement of pig iron is exceedingly slow. There will be some pickup as January gets under way, but most sellers do not anticipate really brisk business much before February.

Pittsburgh — U. S. Steel Corp. banked its No. 4 blast furnace at the Edgar Thomson works in Braddock, Pa., last week. Shutdown is expected to be temporary. With demand low for pig iron, eight of 54 stacks in the Pittsburgh area are now down.

Youngstown—Four more blast furnaces have been taken off here leaving the number of active furnaces here at 16 out of the 25.

Cincinnati—Foundries are looking beyond the holidays for a pickup in business.

Scrap . . .

Scrap Prices, Page 124

Chicago—Such a small tonnage of scrap is being purchased by consumers currently that determination of the market is difficult. This plus the fact steelmaking operations are sliding off and are likely to linger in the neighborhood of 90 per cent of capacity for some weeks is having a depressing effect. Dealers are receiving small tonnage in their yards and offers for this from brokers are running $1 to $2 a ton below a week or two ago.

Boston—Consumption of steelmaking scrap is lower with mill inventories satisfactory. New buying is not expected to revive until mid-January at earliest.

Prices are at lowest postwar levels with practically all grades of steel scrap in a slump.

Yard stocks are fairly large in some cases.

Youngstown—Although little trading is being done in scrap here some small sales of No. 2 heavy melting steel are reported at $28, and No. 2 bundles at $27.

New York—While business is sluggish, some brokers have increased buying prices to a range of $20 to $20.50 for No. 2 heavy melting steel, $18 to $18.50 for No. 2 bundles and $26 to $27 for low phos.

Philadelphia—Scrap trading is in the doldrums, with prices on steelmaking grades generally unchanged and nominal. The Conshohocken, Pa., consumer is no longer taking truck shipments, and there is little moving by rail to any district mill.

Rail crops, 2-ft and under, have dipped in price to $43 to $44. Cast grades are unchanged except for drop broken machinery which is off slightly to a range of $40 to $41.

Pittsburgh—No. 1 heavy melting declined to a range of $32 to $33 last week. In other grades purchases were too infrequent to determine a trend. Market sentiment is weak and shipments low.

Cleveland—Little scrap is moving from yards in this district with plant suspensions widespread over the holidays. Individual plant suspensions vary, some being down only a few days and others the entire holiday week. As a result the market is weak, and while prices are nominally unchanged, expectations are they will go still lower before bottom of the decline is reached.

Mill inventories are substantial and resumption of large-scale buying is thought unlikely for several weeks, especially with the trend of steelmaking operations early in the new year still uncertain.

Cincinnati—Trading took place in only four scrap items in the Cincinnati market. As a result, these items, three of them in the railroad classification, are the only ones to show price changes. Rails dropped $2 a ton. Drop broken machinery also declined $2 a ton while No. 1 railroad heavy melting fell $3 a ton. These adjustments reflect the tenor of the whole market which is decidedly dull.

Detroit—The scrap market is inactive but no price changes are indicated from a week ago. Prices are nominal.

Los Angeles—With the road to export of scrap open, scrap prices are firming. Fifty thousand tons of steelmaking scrap left Los Angeles harbor bound for Japan at prices $3 to $5 higher than posted prices.

Of 180,000 tons of west coast scrap scheduled for shipment, 150,000 tons have been purchased for the Japanese cartel through Hugo Noyes Co., and 30,000 tons will go to two independent mills, not cartel members.

San Francisco—Mills are taking only the best grades of scrap, leaving a surplus of lower grades in dealers' yards. Some pickup in demand for steel scrap is expected soon with anticipated return to operation of Pacific States Steel Corp. this week, long closed down because of

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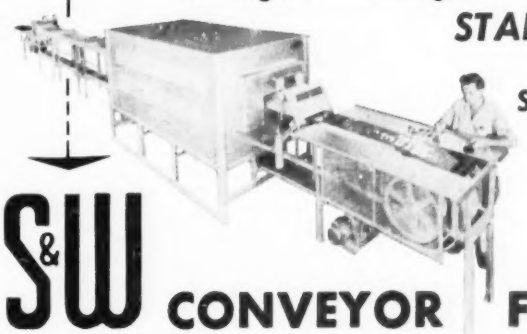

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IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Dec. 24	$31.33
Dec. 17	32.00
Nov. avg.	35.00
Dec. 1952	43.00
Dec. 1948	43.25

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	*32.00-33.00*
No. 2 heavy melting	*28.00-29.00*
No. 1 bundles	*32.00-33.00*
No. 2 bundles	*26.00-27.00*
No. 1 busheling	*32.00-33.00*
Machine shop turnings	19.00-20.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	21.00-22.00
Cast iron borings	20.00-21.00
Cut structurals	36.00-37.00
Heavy turnings	30.00-31.00
Punchings & plate scrap	35.00-36.00
Electric furnace bundles	36.00-37.00

Cast Iron Grades

No. 1 cupola	37.00-38.00
Charging box cast	36.00-37.00
Heavy breakable cast	34.00-35.00
Unstripped motor blocks	29.00-30.00
No. 1 machinery cast	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00-35.00
Rails, 2-ft. and under	46.00-47.00
Rails, 18-in. and under	47.00-48.00
Rails, random lengths	39.00-40.00
Railroad specialties	37.00-38.00

Stainless Steel Scrap (F.o.b. shipping point)

18-8 bundles & solids	165.00-170.00
18-8 turnings	85.00-90.00
430 bundles & solids	85.00-87.00
430 turnings	60.00-62.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	29.00-30.00
No. 2 bundles	24.00-25.00
No. 1 busheling	29.00-30.00
Machine shop turnings	17.00-18.00
Mixed borings, turnings	21.00-22.00
Short shovel turnings	21.00-22.00
Cast iron borings	21.00-22.00
Low phos.	31.00-32.00
Alloy free, short shovel turnings	24.00-25.00
Electric furnace bundles	31.00-32.00

Cast Iron Grades

No. 1 cupola	41.00-42.00
Charging box cast	29.00-30.00
Stove plate	36.00-37.00
Heavy breakable cast	25.00-26.00
Unstripped motor blocks	24.00-25.00
Brake shoes	33.00-34.00
Clean auto cast	43.00-44.00
No. 1 wheels	39.00-40.00
Burnt cast	30.50-31.50
Drop broken machinery	43.00-44.00

Railroad Scrap

No. 1 R.R., heavy melt.	34.00-35.00
R.R. malleable	44.00-45.00
Rails, 3-ft. and under	48.00-49.00
Rails, 18 in. and under	49.00-50.00
Rails, random lengths	41.00-42.00
Cast steel	40.00-41.00
Railroad specialties	37.00-38.00
Uncut tires	39.00-40.00
Angles, splice bars	44.00-45.00
Rails, rerolling	45.00-46.00

Stainless Steel (F.o.b. shipping point)

18-8 bundles, solids	nom. 160.00-170.00
18-8 turnings	nom. 70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	nom. 50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	29.00-30.00
No. 2 bundles	27.00-28.00
Machine shop turnings	16.00-17.00
Short shovel turnings	23.00-24.00
Cast iron borings	23.00-24.00
Low phos.	31.00-32.00
Electric furnace bundles	31.00-32.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00-35.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	31.00
No. 2 heavy melting	28.00
No. 1 bundles	31.00
No. 2 bundles	26.00
No. 1 busheling	*31.00*
Electric furnace bundles	33.00-34.00
Machine shop turnings	19.00
Mixed borings, turnings	21.00
Short shovel turnings	25.00
Structurals & plate	35.00
Heavy turnings	29.00
Couplers, springs, wheels	37.00-38.00
Rail crops, 2 ft & under	*43.00-44.00*

Cast Iron Grades

No. 1 cupola	35.00-36.00
Heavy breakable cast	38.50
Unstripped motor blocks	28.00
Drop broken machinery	*40.00-41.00*

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	23.00-24.00
No. 2 heavy melting	*20.00-20.50*
No. 1 bundles	23.00-24.00
No. 2 bundles	*18.00-18.50*
Machine shop turnings	9.00-10.00
Mixed borings, short turnings	12.00-13.00
Low phos. (structural & plate)	*26.00-27.00*
Short shovel turnings	13.00-14.00

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	21.00-22.00

Stainless Steel

18-8 sheets, clips solids	160.00-165.00
18-8 borings, turnings	85.00-90.00
430 sheets, clips, solids	75.00-80.00
410 sheets, clips, solids	65.00-70.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	23.00-24.00
No. 2 heavy melting	18.25-19.25
No. 1 bundles	23.00-24.00
No. 2 bundles	16.25-17.25
Machine shop turnings	10.50-11.00
Mixed borings, turnings	12.00-13.00
Short shovel turnings	14.00-14.50
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	36.00-37.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	28.00-29.00
No. 2 bundles	22.00-23.00
No. 1 busheling	28.00-29.00
Machine shop turnings	12.00-13.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	15.00-16.00
Cast iron borings	15.00-16.00
Low phos., 18-in.	37.00-38.00

Cast Iron Grades

No. 1 cupola	37.00
Heavy breakable cast	34.00
Charging box cast	34.00
Drop broken machinery	*44.00*

Railroad Scrap

No. 1 R.R., heavy melt.	*30.00-31.00*
Malleable	38.00-39.00
Rails, 18-in. and under	*44.00-45.00*
Rails, random lengths	*36.00-37.00*

CHICAGO

No. 1 heavy melting	*30.00-31.00*
No. 2 heavy melting	24.00-25.00
No. 1 factory bundles	*32.00-33.00*
No. 1 dealer bundles	*29.00-30.00*
No. 2 bundles	24.00-25.00
No. 1 busheling	31.00-32.00
Machine shop turnings	*13.00-14.00*
Mixed borings, turnings	*13.00-14.00*
Short shovel, turnings	*15.00-16.00*
Cast iron borings	*15.00-16.00*
Cut structurals, 3-ft	*34.00-35.00*
Punchings & plate scrap	*34.00-35.00*
Electric furnace bundles	33.00-34.00

Cast Iron Grades

No. 1 cupalo	33.00-34.00
Stove plate	*26.00-27.00*
Unstripped motor blocks	19.00-20.00
Clean auto cast	*37.00-39.00*
Drop broken machine	*37.00-38.00*

Railroad Scrap

No. 1 R.R. heavy melt	33.00-34.00
R.R. malleable	*39.00-40.00*
Rails, 2-ft. and under	45.00-46.00
Rails, 18-in. and under	47.00-48.00
Angles, splice bars	38.00-39.00
Rails, rerolling	42.00-43.00

Stainless Steel Scrap

18-8 clips & solids	*140.00-150.00*
18-8 turnings	*nom. 60.00*
430 clips & solids	*60.00*
430 turnings	nom. 30.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	25.00
No. 2 heavy melting	19.50
No. 1 bundles	26.00
No. 2 bundles	19.00
No. 1 busheling	24.50
Machine shop turnings	12.00
Mixed borings turnings	12.00
Short shovel turnings	13.50
Punchings & plate scrap	28.00

Cast Iron Grades

No. 1 cupola	36.00
Charging box cast	28.00
Stove plate	30.00
Heavy breakable	27.00
Unstripped motor blocks	22.00
Clean auto cast	38.00
Malleable	38.00

BUFFALO

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	26.00-26.50
No. 1 bundles	29.00-30.00
No. 2 bundles	24.00-24.50
No. 1 busheling	29.00-30.00
Machine shop turnings	16.50-17.50
Mixed borings, turnings	18.50-19.00
Short shovel turnings	19.50-20.00
Cast iron borings	18.50-19.00
Low phos.	33.00-34.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	32.00-33.00
No. 1 machinery	37.00-38.00

Railroad Scrap

Rails, random lengths	36.00-37.00
Rails, 2 ft. and under	41.00-42.00
Railroad specialties	39.00-40.00

BIRMINGHAM

No. 1 heavy melting	26.00-26.50
No. 2 heavy melting	24.00-24.50
No. 1 bundles	26.00-26.50
No. 2 bundles	22.00-22.50
Machine shop turnings	19.50-20.50
Short shovel turnings	20.50-21.50
Cast iron borings	20.50-21.50
Cut structurals	nom.
Electric furnace bundles	nom.

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	41.00-42.50
Charging box cast	30.00-31.00
Stove plate	38.00-39.00
Bar crops and plate	38.00-39.00
Cut structurals	36.00-37.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	34.00-35.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	nom.
Rails, 2-ft and under	42.00-43.00
Rails, random lengths	39.00-40.00
Angles, splice bars	38.00-39.00
Rails, rerolling	46.00-47.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	28.00
No. 2 heavy melting	26.00
No. 1 bundles	28.00
No. 2 bundles	24.00
Machine shop turnings	11.00-12.00
Short shovel turnings	12.00-13.00

Cast Iron Grades

No. 1 cupola	38.00-39.00
Charging box cast	27.00-28.00
Heavy breakable cast	29.00-30.00
Unstripped motor blocks	27.00-28.00
Brake shoes	35.00-36.00
Clean auto cast	39.00-40.00
Burnt cast	28.00-29.00

Railroad Scrap

No. 1 R.R. heavy melt.	31.00
Rails, 18-in. and under	44.00-45.00
Rails, random lengths	38.00-39.00
Rails, rerolling	41.00-42.00
Uncut tires	30.00-31.00
Angles, splice bars	35.00-36.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	27.00
No. 2 heavy melting	23.00
No. 1 bundles	24.00
No. 2 bundles	19.00
No. 3 bundles	15.00
Machine shop turnings	12.00
Mixed borings, turnings	12.00
Short shovel turnings	12.00
Electric furnace, No. 1	36.00-38.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	30.00-35.00
Heavy breakable cast	25.00-32.00
Unstripped motor blocks	23.00
No. 1 wheels	38.00-40.00
Stove plate	29.00

Railroad Scrap (Delivered consumer plant)

Rails, random lengths	30.00-34.00

SAN FRANCISCO

No. 1 heavy melting	23.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	19.00
No. 1 busheling	24.00
Machine shop turnings	7.00
Mixed borings, turnings	7.00
Short shovel turnings	11.00
Cast iron borings	11.00
Cut structurals	28.00
Heavy turnings	11.00
Punchings & plate scrap	28.00
Electric furnace bundles	22.00

Cast Iron Grades

No. 1 cupola	39.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	29.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

LOS ANGELES

No. 1 heavy melting	23.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	19.00
Machine shop turnings	7.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	40.00-41.00

HAMILTON, ONT.

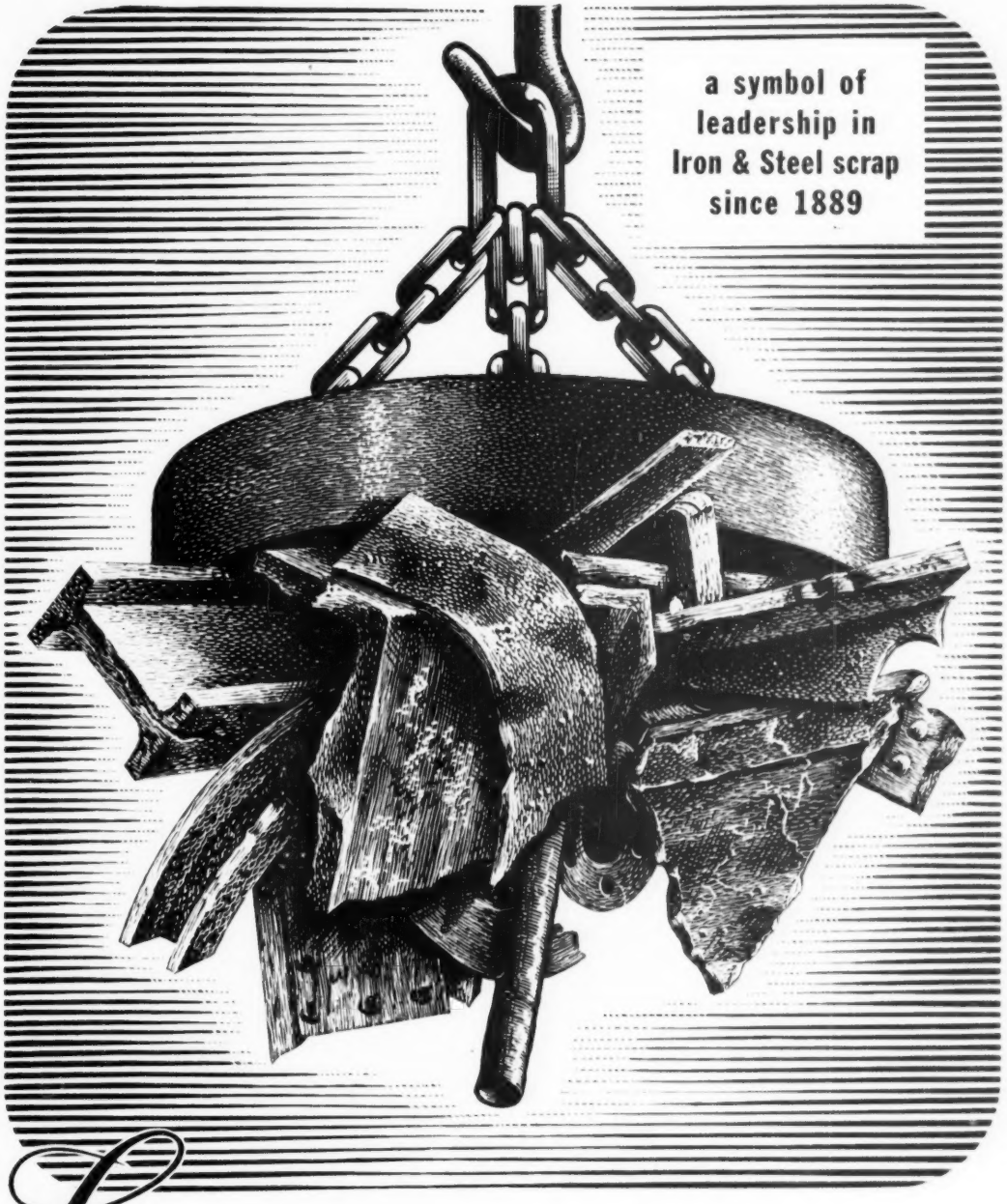
(Delivered prices)

Heavy melting	$32.50
No. 1 bundles	32.50
No. 2 bundles	32.00
Mechanical bundles	30.50
Mixed steel scrap	28.50
Mixed borings, turnings	20.00
Rails, remelting	32.50
Rails, rerolling	41.50
Busheling	26.50
Busheling new factory:	
Prep'd	30.50
Unprep'd	28.50
Short steel turnings	20.00

Cast Iron Grades†

No. 1 machinery cast	46.00

†F.o.b., shipping point.



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PITTSBURGH, PENNA.
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IMPORT & EXPORT DIV. LIVINGSTON & SOUTHARD, INC. 50 Broadway, New York, N. Y. *Cable Address:* FORENTRACO

a strike. Cast grades are firm. No. 1 cupola is a strong $39 a ton.

Seattle — The scrap market is dormant with leading consumers well stocked and uninterested in dealer offerings. It is expected when buying is resumed it will be at the present level of quotations, $27 for No. 1 heavy melting, and $23 for No. 2. Heavy breakable sold at $31.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

24,960 tons, Newark Bay bridge, New Jersey Turnpike Commission, to Bethlehem Steel Co., Bethlehem, Pa., noted recently as low bidder.

3500 tons, main intake gates and appurtenances, four schedules, The Dalles dam, Columbia river, to Willamette Iron & Steel Co. (Guy F. Atkinson Co.) Portland, Oreg., low $1,860,972.

3095 tons, bridge, Rockland county, New York, for the State Thruway Commission, to the K. L. Klevins Corp., Yonkers, N. Y.; this will be an all-welded job.

2500 tons, power plant extension, Connecticut Light & Power Co., Devon, Conn., to Bethlehem Fabricators, Inc., Bethlehem, Pa.; United Engineers & Construction Co., Philadelphia, engineer and contractors.

1740 tons, coal and ash handling facilities, power plant for City Transit Authority, 74th St., New York, through National Structurals Inc., to Bethlehem Steel Co., Bethlehem, Pa.

1167 tons, shed, Pier C, Hoboken, N. J., through J. Rich Steers Inc.; to the Elizabeth Iron Works, Elizabeth, N. J.

950 tons, electrical and electronics building, Norfolk naval shipyard, Portsmouth, Va., to Globe Iron Construction Co., Norfolk; Cramer-Vollmerhausen Co., Inc., Washington, D. C., general contractor.

870 tons, circulating water system, Portsmouth, O., through Merritt-Chapman & Scott Inc., to the American Locomotive Co., Schenectady, N. Y.

762 tons, state highway bridge, Orange county, New York, through Johnson, Drake & Piper Inc., to the Ernst Construction Corp., Buffalo.

500 tons or more, S6 intake gate hydraulic cylinders, The Dalles dam, general contract to Premier Gear & Machine Works, Portland, Oreg., low $457,420; bids opened Nov. 20 by U. S. Engineer.

495 tons, engineering research building, reaction motors, Denville, N. J., through the Ferber Co., to Elizabeth Iron Works, Elizabeth, N. J.

470 tons, Lake Meadows housing development, Chicago, for New York Life Insurance Co., to Wendnagel & Co., Chicago; B. W. Handler Construction Co., Chicago, contractor.

320 tons, Fontbonne Academy, Milton, Mass., to West End Iron Works, Cambridge, Mass.; M. S. Kelliher Co., Boston, general contractor.

155 tons, warehouse addition, Hunters Point Steel Co., Long Island city, to Goodstein Iron & Steel Co., Bronx.

149 tons, dormitory building, Clarkson College, Potsdam, N. Y., through Frechette Clough Construction Co., to the Utica Structural Steel Co., Utica, N. Y.

150 tons, manufacturing building, Wire Grip Co., Middletown, N. Y., through the Sudler Construction Co., to Sheny & Gordon, New York.

100 tons or more, junior high school building, Rocky Hill, Conn., to Standard Structural Steel Co., Hartford, Conn.; reinforcing to Scherer Steel Co., Hartford; F. R. Jones Co., Newington, Conn., general contractor.

100 tons, alterations, Lincoln Liberty office building, Philadelphia to Bethlehem Steel Co., Bethlehem, Pa.

STRUCTURAL STEEL PENDING

1300 tons, Liberty Ave. bridge, Pittsburgh, for Pennsylvania railroad; bids readvertised for Dec. 31; originally bids were scheduled for Dec. 11.

1200 tons, high school, East Queens, New York city, Caristo Contracting Co., Brooklyn, low on general contract.

1128 tons, nurses hospital, Jamaica, Long Island, John T. Brady & Co., New York city, low on general contract.

730 tons, store, W. T. Grant, Philadelphia, George A. Fuller & Co., New York, low on general contract.

650 tons, municipal welfare center, Brooklyn, pending.

640 tons, 15-story apartment house, southeast corner 16th St. and 6th Ave., New York city, bids asked; Sager Construction Co., 750 Grand Concourse, Bronx, is owner.

600 tons, also 55 tons of sheet steel piling, drum gates, appurtenances, etc., Missouri diversion dam, Wolf Point, Montana; bids to Bureau of Reclamation, Denver, about Feb. 2.

445 tons, state bridges, Billerica, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Coleman Bros. Co., Boston, general contractor.

350 tons, grade crossing, Hammel station, in Rockaway area, for City Transit Authority, New York, bids asked.

350 tons, power house, Picatinny, N. J., arsenal, bids to be closed early in January.

245 tons, state bridges, Billerica-Chelmsford, Mass., to West End Iron Works, Cambridge, Mass.; M. Rotundi & Sons Co., general contractor.

210 tons, two-span continuous welded girder bridge with 203.8-foot skew span, Wilbur Cross highway, Union, Conn.; bids Jan. 11, Hartford, Conn.

100 tons, also 50 tons of reinforcing bars, Washington state Benton county highway bridge; general contract to Cherf Bros. & Sandkay, Ephrata, Wash., low $239,974.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1750 tons, electronics and electrical building, Norfolk naval shipyard, Portsmouth, Va., to Virginia Steel Co., Richmond; Cramer-Vollmerhausen Co., Inc., Washington, D. C., general contractor.

455 tons, power plant extension, Connecticut Light & Power Co., Devon, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; United Engineers & Construction Co., Philadelphia, engineer and contractor.

125 tons, Fontbonne Academy, Milton, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; M. S. Kelliher Co., Boston, general contractor.

REINFORCING BARS PENDING

1750 tons, Missouri river diversion dam, Wolf Point, Montana; bids to Bureau of Reclamation, Denver, about Feb. 2.

265 tons, reinforced concrete underpass, Soldiers' Field road, Boston; bids in to Metropolitan District Commission, Boston.

200 tons, Fairbanks, Alaska, high school; Reed & Martin, Fairbanks, low base bidders, $1,966,207.

100 tons, Washington state Snohomish county railroad overcrossing; general contract to F. F. Dooley, Everett, Wash., low $135,828.

100 tons, including shapes, Washington state fisheries plant; Scheumann & Johnson, Seattle, low $189,660.

PLATES . . .

PLATES PENDING

620 tons, underground waste storage tanks, Hanford Works; general contract to Gaasland Co., Bellingham, Wash., low $1,724,845, by Atomic Energy Commission.

218 tons, tanks, Maguire Air Force Base, Wrightstown, N. J., B. J. Lucarelli, Jersey City, N. J., low on general contract.

200 tons, 500,000-gallon water storage tank, Tooele ordnance depot, Tooele, Utah; bids to Corps of Engineers, San Francisco.

100 tons, two 25,000 bbl. underground tanks, Kindley Airfield Base, Bermuda; bids Jan. 8, Corps of Engineers, New York.

100 tons, elevated water tank, veteran's hospital, Coatesville, Pa., Tippett & Wood, Phillipsburg, Pa., low, $69,800.

RAILS, CARS . . .

RAILROAD CARS PLACED

Western Fruit Express, 250 fifty-ton end-bunker steel refrigerator cars, and 50 seventy-ton mechanical all-purpose refrigerator cars to its own shops.

Burlington Refrigerator Express Co., 200 fifty-ton steel refrigerator cars to its own shops.

CIMCO MACHINE TOOLS AT BARGAIN PRICES

32" x 23' centers, PITTSBURGH Lathe, Timken Bearings, two carriage with power traverse to each, late type.
30" x 14' American G. H. Lathe, 12 speeds.
25/50 x 6/10 LeBlond Sliding Bed Gap Lathe, Timken Bearing.
24" x 18' bed, Lodge & Shipley, 12 spindle speeds.
18" x 54" centers, Lodge & Shipley, late type, 24 spindle speeds, taper attachment.
16" x 8' American, 3 S C D. 56" center distance, 1¾" hole in spindle.
16" x 6' Lodge & Shipley, single pulley drive, 12 spindle speeds.
Gisholt 1L Saddle Type Turret Lathe, bar feed, late type.
Libby 3H Turret Lathe, 2" hole in spindle.
Cincinnati #3 Centerless Grinder.
Heald #78 Centerless Internal & Cylindrical Grinder, late type, complete.
Landis 26" x 168" Plain Cylindrical Grinder.
Norton 10 x 24 Surface Grinder.
Jones & Lamson 8 x 31 Thread Grinder.
Oliver Template Tool Bit Grinder.
Sellers 4 T Tool Grinder, motor drive.
Sellers 6 T Tool Grinder, late type.
Heald 42 Borematic.
Bullard 54" Spiral Drive Vertical Boring Mill, 4 jaw chuck table.
King 42" Vertical Boring Mill, 2 heads.
Niles 36-44 Boring Mill.
Niles 42"—50" Driving Box Borer, Burnisher & Facer, late type
Fellows #725 Gear Shaper, with spur guide.
Fellows 612 Spur Gear Shaper.
Gould & Eberhardt 16" Back Geared Shaper.
Gould & Eberhardt 24" Back Geared Shaper.
Gould & Eberhardt 28" Shaper, gear box.
Smith & Mills 32" Shaper, gear box.
American 5'14" Column Triple Purpose Radial Drill, motor driven thru Turner gear box on arm.
Cincinnati Bickford 3' 9" column radial drill, late type.
Foot-Burt 3 Spindle Drill Press, new 1947, #2 taper spindles, 2 with power feed.
Milwaukee 2 HL Plain Miller Late Type.
Milwaukee 2D Rotary Head Miller.
Hall Planetary Style D Miller.
Cleveland 30 x 30 x 10' Openside Planer, self-contained motor drive.
Niles 48" x 48" x 16' Double Housing Planer, 4 heads, box table, DC reversible drive.
Barber-Colman HRS Combination Sharpener.
Bliss #58 Drawing Press 5" Stroke.
Gould & Eberhardt 96H Hobber.
Niles 12' x ⅝" Initial Type Bending Roll.
H P M 750 ton Triple Action Hydraulic Press, new 1942.

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"GUARANTEED MACHINERY"
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NEW GAS BURNERS
AT A TREMENDOUS SAVING

36—#200 Tate-Jones Universal Burner Sets, 1,400,000 BTU input per hour.
16—#100, as above, 700,000 BTU input per hour.

Burners are complete with auxiliary equipment. They are for use with steel furnaces, heat treating, forging, steel mills, incinerators, brick furnaces and other uses. Detailed spec. and price on request.

DALTON SUPPLY COMPANY
2829 Cedar Street Phila., Pa.

RAILROAD EQUIPMENT—*FOR SALE*

USED **AS IS** **RECONDITIONED**

STANDARD GAUGE FREIGHT CARS

Box, Steel Sheathed, 40-Ton Capacity

Box, Double Sheathed, 50-Ton Capacity

Box, Single Sheathed, 50-Ton Capacity

Flat, 50-Ton, Steel Underframe, 40'6" Long

Gondolas, Composite, or All Steel 50-Ton and 70-Ton

Hoppers, Twin, All-Steel, 50-Ton, Cross Dump

Ore Hoppers, All-Steel, 50-Ton, Heavy Duty

Tank, 3,000-Gallon, High Pressure

Tank, 8,000-Gallon, Coiled and Non-Coiled

Hoppers, All Steel, 70-ton, Triple Hopper Cross Dump

CABOOSE CARS

Eight Wheel, Cupola Type

AUSTIN-WESTERN 30-YARD AIR DUMP CARS; STANDARD GAUGE; 50-TON, SIDE DUMP, DROP DOOR

OTHER EQUIPMENT

Jordan Spreader — Overhead Cranes

Locomotive Cranes — Railroad Track Scales

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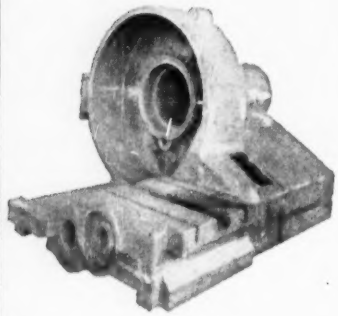

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Advertising Index

American Brass Co., The 92
American Chemical Paint Co. 16, 112
American Roller Die Corporation 87
Armco Steel Corporation 22
Associated Spring Corporation 36
Avondale Marine Ways, Inc. 122

Bakelite Co., A Division of Union Carbide & Carbon Corporation 115
Baker, J. E., Co., The 55
Baldwin-Lima-Hamilton, Standard Steel Works Division 119
Barium Steel Corporation 2
Barnes-Gibson-Raymond, Division of Associated Spring Corporation 36
Barnes, Wallace, Co., Division of Associated Spring Corporation 36
Barnes, Wallace, Co., Ltd., The, Division of Associated Spring Corporation 36
Bethlehem Steel Co. 1
B-G-R Cook Plant, Division of Associated Spring Corporation 36
Bixby, R. W., Inc. 127
Bliss, E. W., Co. 15
Browning, Victor R., & Co., Inc. 122
Bullard Co., The 40

Champion Rivet Co., The 116
Cincinnati Machinery Co., Inc. 126
Cincinnati Shaper Co., The 11
Cleveland Steel Tool Co., The 122
Cleveland Worm & Gear Co., The Inside Back Cover
Colorado Fuel & Iron Corporation, The, Wickwire Spencer Steel Division 53
Conco Engineering Works Division of H. D. Conkey & Co. 111
Copperweld Steel Co. 43
Crucible Steel Company of America 63
Cutler-Hammer, Inc. Back Cover

Dempster Brothers 117
Detrex Corporation 90
Detroit Stamping Co. 122
Diamond Mfg. Co. 120
Dravo Corporation 113
Dulien Steel Products, Inc. 127
Dunbar Brothers Co., Division of Associated Spring Corporation 36

Eastern Machine Screw Corporation, The 120
Electric Controller & Mfg. Co., The Inside Front Cover

Fawick Airflex Division, Federal Fawick Corporation 51
Federal Fawick Corporation, Fawick Airflex Division 51
Follansbee Steel Corporation 82

Gibson, William D., Co., The, Division of Associated Spring Corporation 36
Gisholt Machine Co. 25
Globe Brick Co., The 108
Goodyear Tire & Rubber Co., Inc., The 4
Gorham Tool Co. 12
Great Lakes Steel Corporation 57

Hendrick Manufacturing Co. 106
Hyde Park Foundry & Machine Co. 128

Ingalls Iron Works Co., The 97
Iron & Steel Products, Inc. 127

Kidde, Walter, & Co., Inc. 10

Landis Machine Co. 8
Lee, K. O., Co. 120
Leeds & Northrup Co. 14
Link-Belt Co. 120
Lurie Brothers & Co., Inc. 125

McKay Machine Co., The 35
McKee, Arthur G., & Co. 77

Macwhyte Co. 3
Mannesmann-Meer Engineering & Construction Co. 103
Manross, F. N., & Sons Co., Division of Associated Spring Corporation 36
Marchant, Geo. F., Co. 114
Milwaukee Division of Associated Spring Corporation 36
Mine Safety Appliances Co. 16
Monarch Machine Tool Corporation, The 61

National Steel Corporation 9, 57
New York & New Jersey Lubricant Co. 114

Ohio Division of Associated Spring Corporation 36
Ohio Locomotive Crane Co., The 120
Ottawa Steel Products, Inc. 116

Pawtucket Manufacturing Co. 6
Paxson Machine Co. 109
Pheoll Manufacturing Co. 47
Precision Extrusions 5

Raymond Manufacturing Co., Division of Associated Spring Corporation 36
Roebling's, John A., Sons Corporation 17
Ryerson, Joseph T., & Son, Inc. 26

Sargeant & Wilbur, Inc. 123
Sciaky Brothers, Inc. 110
Seaboard Coil Spring Division of Associated Spring Corporation 36
SKF Industries, Inc. 13
Sperry Products, Inc. 85
Square D Co. 89
Standard Oil Co. 65
Standard Steel Works Division, Baldwin-Lima-Hamilton 119

Texas Co., The 18
Thomas Machine Manufacturing Co. 106
Thompson Products, Inc., Jet Division 58
Timken Roller Bearing Co., The, Steel & Tube Division 44
Tinnerman Products, Inc. 48
Toledo Stamping & Manufacturing Co. 122

Union Carbide & Carbon Corporation, Bakelite Co. 115

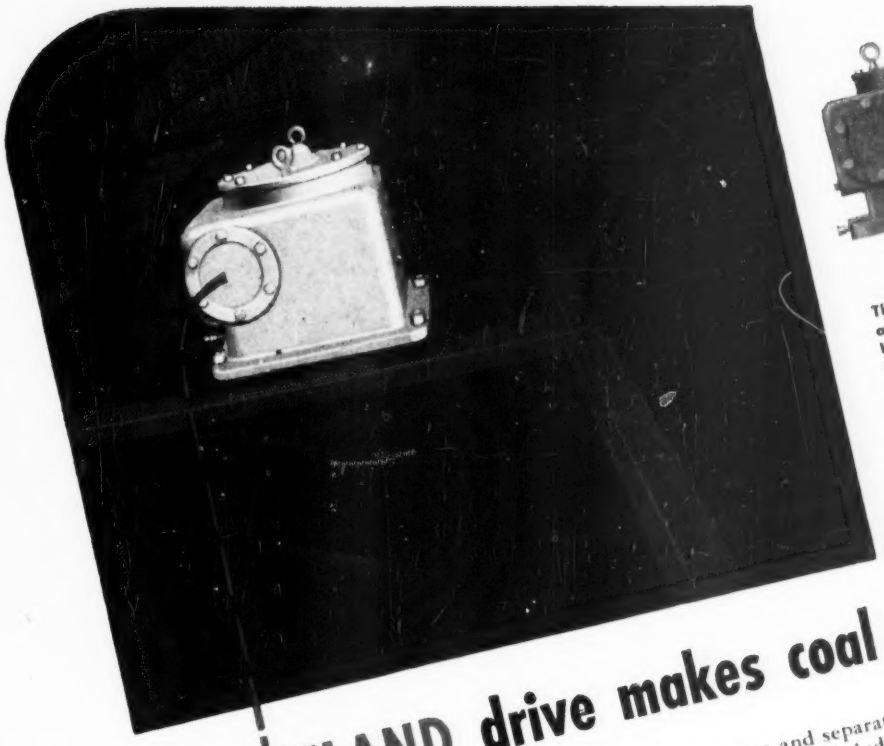
Verson Allsteel Press Co. 7

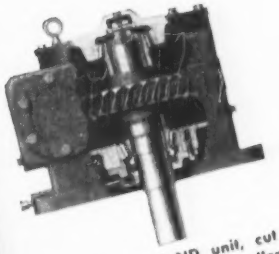
Warner & Swasey 66
Washburn Wire Co. 107
Weirton Steel Co. 9
Westinghouse Electric Corporation, Air Conditioning Division 21
Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation 53

Youngstown Sheet & Tube Co., The 80

Table of Contents, Page 5

Classified Advertising, Pages 126, 127





The Cleveland ND unit, cut away to show tapered roller bearings on gear shaft, positive, face-type oil seal, piston type lubricating pump and oil drain at base of housing.

At left—Froth-Flotation Unit cleaning and reclaiming coal fines in a Pennsylvania anthracite coal preparation plant. Photo courtesy of Wilmot Engineering Company.

Steady CLEVELAND drive makes coal come clean

THIS Wilmot Froth-Flotation Unit cleans and separates marketable fine coal from high-ash particles and sludge. To create the cleansing froth that removes coal from refuse, the builder employs the vertical Cleveland worm gear drive shown at work above. No matter what the density of the feed, Cleveland drives the agitator smoothly and powerfully, day in day out, year after year.

Cleveland vertical worm gear drives—ND and its companion NU unit (with drive shaft upward)—are designed especially for agitator service. Equipped with heavy-duty tapered roller bearings on an over-sized shaft, dust-proof and moisture-proof, they operate dependably on the toughest jobs in the coal industry.

The reliable performance of these rugged units explains why coal machinery builders and users alike depend upon Cleveland wherever a steady right-angle drive is needed. Write today for Catalog 400 for description of these and other worm gear drives in the complete Cleveland line. The Cleveland Worm & Gear Company, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Speed Reducers

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MOTOR CONTROL
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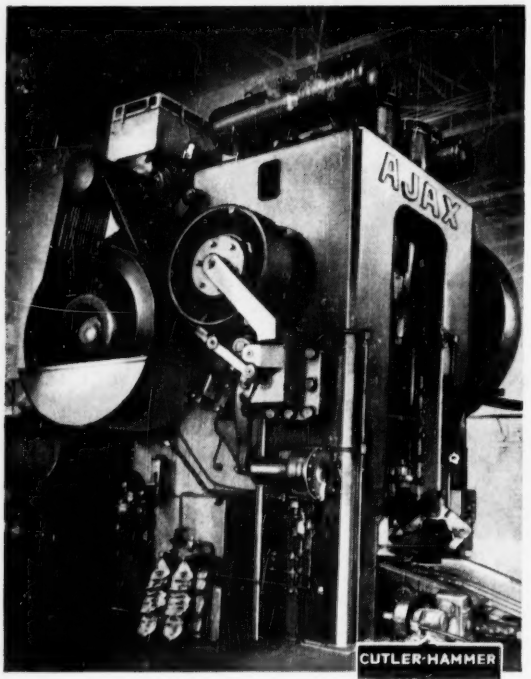
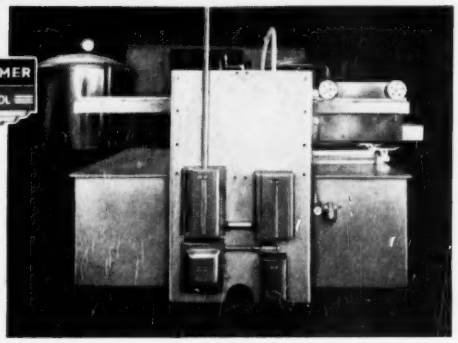
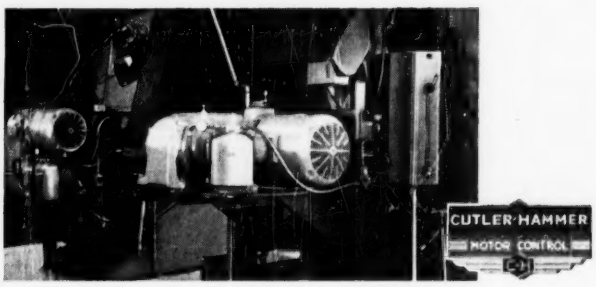


AJAX 6000 TON HIGH SPEED FORGING PRESS COMPLETELY EQUIPPED WITH CUTLER-HAMMER MOTOR CONTROL.



AUTO-VAC PLASTICS FORMING MACHINE 100% EQUIPPED WITH CUTLER-HAMMER MOTOR CONTROL.



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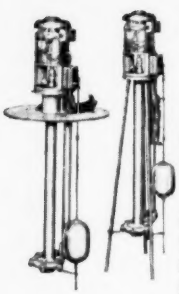

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